

FOUR YEAR B. Tech. DEGREE COURSE
Scheme of Instruction and Examination
 (Effective from 2020–21)

I Semester (CE)

Scheme : 2020

S. No.	Category	Subject	Credits	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
				L	D/T	P	End Exam	CIA Marks	Total
I		Theory							
1	BSC	Engineering Mathematics - I	3	2	1	-	60	40	100
2	BSC	Engineering Chemistry	3	3	-	-	60	40	100
3	HSSC	English	3	3	-	-	60	40	100
4	ESC	Engineering Drawing	3	1	4	-	60	40	100
5	ESC	Programming for Problem Solving	3	3	-	-	60	40	100
6	Audit	English Proficiency Course	-	-	-	3	-	-	-
II		Practical							
7	BSL	Engineering Chemistry Lab	1.5	-	-	3	60	40	100
8	HSSL	Phonetics & Communication Skills Lab	1.5	-	-	3	60	40	100
9	ESL	Programming for Problem Solving Lab	1.5	-	-	3	60	40	100
		Total	19.5						

ENGINEERING MATHEMATICS – I (EM1)

I Semester : Common for CSE, CST, CE & ME					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS101	BSC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	-	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course the student will be able to								
CO1: Find the solution for simultaneous system of linear equations and Eigen values and Eigen vectors.								
CO2: Solve first order differential equations and its applications.								
CO3: Solve higher order differential equations and its applications.								
CO4: Understand Rolle's and Lagrange's mean value theorems. Evaluate maxima & minima and areas and volumes by multiple integrals.								
CO5: Learn Laplace transform of a function and solve the differential equations using Laplace transforms								
UNIT – I								
Matrices Rank of a matrix, Consistency of systems of linear equations, Rouche's Theorem (Statement only). Eigen values and Eigen vectors, diagonalization of a matrix. Cayley-Hamilton Theorem, finding inverse of a matrix. Quadratic form, reduction of a quadratic form to canonical form by orthogonal transformation								
UNIT - II								
Differential Equations First order and first degree differential equations - Exact, Non-exact equations, Linear and Non-linear equations. Applications: Newton's law of cooling, law of natural growth and decay, L-R and C-R circuits.								
UNIT – III								
Higher Order Differential Equations Homogeneous linear differential equations of second and higher order with constant coefficients, Non-homogeneous term of the type $f(x) = e^{ax}, \sin ax, \cos ax, x^n, e^{ax}v(x), xv(x)$ and General case. Applications to L-C-R circuits.								
UNIT – IV								
Differential Calculus Rolle's theorem, Lagrange's mean value theorem. Maxima and minima of functions of two variables.								
Multiple Integrals Double integrals, change of order of integration, Change to polar coordinates. Area and volume by double integration. Triple integrals, volume by triple integrals.								
UNIT - V								
Laplace Transforms Laplace transform of standard functions, first & second shifting theorems, Laplace transforms of derivatives, integrals, multiplication by t, division by t and periodic functions. Inverse Laplace transforms, Convolution Theorem. Applications of Laplace transforms to ordinary differential equations.								

Text Books

1. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, 42nd Edition, 2012
2. T.K.V. Iyengar and others, *A Text Book of Engineering Mathematics, Vol. I & II*, S.Chand & Company, 13th Edition 2014

Reference Books

1. B.V. Ramana, *Higher Engineering Mathematics*, TMH Publishers, 2nd Edition, 2006.
2. N.P. Bali and others, *A Text Book of Engineering Mathematics*, Lakshmi publishers, 7th Edition, 2009.
3. Erwyn Kreyszig, *Advanced Engineering Mathematics*, John Wiley, 8th Edition 2006.

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

ENGINEERING CHEMISTRY (EC)

I / II Semester : CE, EEE, ME / ECE					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BS109	BSC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	-	-	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course the student will be able to								
CO1: Understand the concept of electrochemistry distinguishes primary and secondary cell, energy storage devices and explains the concept of corrosion with preventing methods.								
CO2: Describes the water quality issues for steam generation in the boilers and problems associated with treatment.								
CO3: Understand the basic concepts of phase rule and refractories.								
CO4: Judge the quality of coal, petrol, diesel and lubricants. Understands the efficiency of combustion.								
CO5: Understand the chemistry of polymers and composites.								
UNIT – I								
Electrochemistry & Corrosion								
Single electrode potential- Determination. EMF of a cell and its measurement, Nernst equation, numerical problems. Electrochemical series & its applications. Electrochemical energy systems – primary batteries – dry cell, secondary batteries- lithium ion battery, Fuel cells-H ₂ -O ₂ Fuel cell. Conductometric titrations.								
Process of Chemical & electrochemical corrosion and their mechanisms. Galvanic series. Galvanic corrosion, stress corrosion. Concentration cell corrosion- differential aeration corrosion, metal ion concentration corrosion and pitting corrosion. Factors influencing corrosion. Corrosion control methods - Cathodic protection and corrosion inhibitors. Protective coatings - Metallic coatings - Hot dipping – Galvanization and Tinning, Organic coatings - Paints.								
UNIT – II								
Water Chemistry								
Hardness of water- Types, expression, units and numerical problems. Analysis of water- Determination of hardness of water by EDTA method, alkalinity & dissolved oxygen by Winkler's method. Disadvantages of hard water-boiler troubles-scale and sludge, caustic embrittlement, priming & foaming and boiler corrosion. Water softening methods – internal conditioning - calgon process, colloidal conditioning & external conditioning – zeolite process and ion exchange process.								
Desalination – reverse osmosis.								
UNIT – III								
Phase rule & Refractories								
Terms involved in phase rule equation, definition, explanation with examples. Application to one component system - water and sulphur systems. Condensed phase rule-Two component alloy systems - Pb-Ag system.								
Refractory-classification. Properties- refractoriness, refractoriness under load, thermal spalling, porosity and thermal conductivity. Reasons for failure of refractory.								
UNIT – IV								

Fuel Technology & Lubricants

Fuels-Classification. Calorific value-types, units and its determination by Bomb calorimeter. Solid fuels- Coal-proximate and ultimate analysis. Liquid fuels – Petroleum-refining, cracking-catalytic cracking. Synthetic petrol-Fischer-Tropsch's & Bergius process, Reforming of petrol, knocking-octane number, diesel-cetane number. Preparation of biodiesel. Gaseous fuels-Composition & uses of Natural gas, LPG & CNG. Combustion-numerical problems - calculation of volume and mass of oxygen and air. Flue gas Analysis by Orsat's Apparatus.

Lubricants - Classification of lubricants with examples. Definition and significance of the following characteristics of a good lubricating oil- viscosity, viscosity index, flash & fire point, acid number, saponification value, pour point and cloud point.

UNIT – V**Polymers & Composites**

Fundamentals of addition & condensation polymerization with examples. Thermoplastic and Thermosetting plastics. Preparation, properties and uses of PVC, TEFLON, Nylons, Bakelite, Polyurethane. Rubber – Processing of latex. Drawbacks of natural rubber, vulcanization, properties of vulcanized rubber. Synthetic rubber- Buna S, Buna N, Silicone and Butyl Rubbers. Polymer composites – definition and uses of FRP - laminar composites.

Text Books :

1. P.C. Jain and Monika Jain, *Engineering Chemistry*, Dhanpat Rai and Sons, New Delhi 2010, 15th edition.

Reference Books :

1. Shashi Chawla, *A Reading of Engineering Chemistry*, 3rd Edition, Dhanpat Rai and Co., New Delhi, 2011, 3rd edition.

2. Gowariker et al., *Polymer Science and Technology*, Prentice Hall of India Pvt. Ltd., New Delhi, 2004, 10th reprint.

3. Puri Sharma and Pathania, *Principles of Physical Chemistry*, Vishal Publishing Co., Jalandhar. 1991, 31st Edition.

4. Kuriacose. J.C and Rajaram. J, *Engineering Chemistry*, Volume I / II, Tata McGraw – Hill Publishing Co. Ltd. New Delhi, 2010, 2nd edition.

5. S.S. Dara, *A Textbook of Engineering Chemistry*, S. Chand & Co. Ltd., New Delhi.

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

ENGLISH (ENG)

I / II Semester: Common for CE, EEE, ME / ECE, CSE & CST					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
HU101	HSSC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	-	-	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes: At the end of the course, Students will be able to								
CO1: Use Grammatically acceptable English in Oral and Written communication.								
CO2: Use appropriate Vocabulary in Technical and General Contexts.								
CO3: Comprehend General and Technical Content using various Reading Skills like Skimming and Scanning.								
CO4: Write Letters, Summaries and Essays of topical, Narrative, Descriptive, Analytical and Persuasiveness.								
CO5: Write Job Applications, Resumes, Memos and E-mails.								
UNIT – I								
I Have a Dream: An Independent, Development and Strong India – Dr. A.P.J. Abdul Kalam Vocabulary : Synonyms and Antonyms Grammar : Parts of Speech, Types of Nouns, Pronouns and Adjectives Reading : Reading with a Purpose: Reading for Understanding, Note - Making Writing: Punctuation, Writing notes and Paragraphs, Note – Taking								
UNIT – II								
The Doctor's Word – R.K. Narayan Vocabulary : One-word Substitutes, Idioms and Idiomatic Phrases Grammar : Adverbs, Verbs –Verb forms, Types of Verbs, Prepositions, Conjunctions and Articles, Word Order Reading : Skimming and Scanning, Reading Comprehension Writing : Business Letters& E-mail Writing								
UNIT – III								
Stay Hungry, Stay Foolish - Steve Jobs Vocabulary : Prefixes and Suffixes, Homophones and Homonyms Grammar : Tenses, Concord, Voices and Reported Speech Reading : Use of Dictionary, Thesaurus, Library and Internet for Information Writing : Writing Cover Letters for Job Applications and ResumePreparation								
UNIT – IV								
Once there was a King – Rabindranath Tagore Vocabulary : Words often Confused and Collocations Grammar : Question Tags, Degrees of Comparison, Transformation of Sentences and Correction of Sentences Reading : Précis Writing Writing : Memo Writing								
Detailed Study Text:								
1. D. Sudha Rani, <i>The Enriched Reading</i> , Pearson India Education Services Pvt. Ltd., Second Impression, 2017.								

Reference Books:

1. Michael Swan, *Practical English Usage*, Third Edition, OUP, 2006.
2. David Green, *Contemporary English Grammar*, Structure and Composition, Second Edition, Lakshmi Publications, 2015.
3. *Oxford Advanced Learner's Dictionary of Current English*, OUP, 2015.
4. Meenakshi Raman and Sangeetha Sarma, *Technical Communication Principles and Practice*, 3rd Edition, OUP, 2015.
5. Raj N Bakshi, *English Grammar Practice*, Orient Black Swan, 2005.
6. Sangeeta Sharma & Binod Mishra, *Communication Skills for Engineers and Scientists*, PHILearning Private Limited.
7. M. Ashraf Rizvi, *Effective Technical Communication*, Tata McGraw-Hill Publishing Company Ltd., 2005.
8. A. Ramakrishna Rao, G. Natanam & S.A. Sankaranarayanan, *English Language Communication: A Reader cum Lab Manual*, Anuradha Publications, Chennai, 2006.

Question Paper Pattern:**Sessional Exam :****I Sessional Examination : 25 Marks**

1. Short Answer Questions – 4 Marks
2. Vocabulary – 4 Marks
3. Grammar – 4 Marks
4. Reading Comprehension – 5 Marks
5. Business Letter – 4 Marks
6. E-mail Writing – 4 Marks

II Sessional Examination : 25 Marks

1. Short Answer Questions – 4 Marks
2. Vocabulary – 4 Marks
3. Grammar – 4 Marks
4. Précis Writing – 4 Marks
5. Memo Writing – 4 Marks
6. Job Application Letter – 5 Marks

End Exam :

1. Short Answer Questions – 8 Marks
2. Vocabulary – 8 Marks
3. Grammar – 12 Marks
4. Reading Comprehension – 5 Marks
5. Précis Writing – 5 Marks
6. Job Application Letter – 10 Marks
7. E-mail Writing – 6 Marks
8. Memo Writing – 6 Marks

ENGINEERING DRAWING (ED)

I / II Semester : Common to CE, ME, EEE / ECE, CSE, CST					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ME101	ESC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		1	-	4	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course students will be able to								
CO1: Understand the concept of projections of an object and draw the projection of points, straight lines and planes								
CO2: Draw projection of regular solids								
CO3: Draw the sectional views of regular solids and their surface developments								
CO4: Draw the orthographic views from given isometric view								
CO5: Draw the isometric views from the orthographic views								
UNIT – I								
<i>Introduction to Engineering Drawing</i> Drawing instruments and their uses, Lettering and Dimensioning. Introduction to polygons and conics. Introduction to scales (not for End examinations)								
<i>Orthographic projections</i> Introduction, planes of projections, projections of points. First angle projection- Projections of straight lines- parallel to one and inclined to other plane- Inclined to both the planes, traces of lines (treatment is limited to simple problems only)								
<i>Projection of planes</i> Regular planes- perpendicular, parallel to one reference plane and inclined to other reference planes - Inclined to both the reference planes								
UNIT –II								
<i>Projections of solids</i> Projections of right regular solids- prism, pyramid, cylinder and cone with axis inclined to one plane and inclined to both planes.								
UNIT – III								
<i>Sections of Solids</i> Sectional views of right regular solids-prism, pyramid, cylinder and cone. True shapes of Sections (Treatment is limited to simple problems only)								
<i>Development of Surfaces</i> Development of surfaces of right regular solids and their sections - prism, pyramid, cylinder and cone.								
UNIT – IV								
<i>Orthographic projections</i> Conversion of pictorial views into orthographic views (treatment limited to simple blocks)								
UNIT – V								
<i>Isometric Projections</i> Principle of Isometric projection, Isometric scale, Isometric projections of simple planes, regular solids and compound solids.								

Text Books:

1. K.L. Narayana and P. Kanniah, *Text book on Engineering Drawing*, Second Edition, Scitech Publications, Chennai, 2006.
2. N.D. Bhatt and V.M. Panchal, *Elementary Engineering Drawing*, 45th Edition, Charotar Publishing House, Anand, India, 2002.

Reference Books:

1. K. Venugopal, *Engineering Drawing and Graphics with Auto CAD*, Fourth Edition, 2001, New Age International(P) Limited, Publishers, New Delhi, 2001.
2. Dhananjay A Jolhe, *Engineering Drawing with an introduction to Auto CAD*, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2008.
3. M.B. Shaw & B.C. Rana, *Engineering Drawing*, Second Edition Pearson Education, New Delhi, 2009.

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End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

PROGRAMMING FOR PROBLEM SOLVING (PPS)

I Semester : Common for CE, CSE, CST, ECE, EEE & ME						Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks			
CS101	ESC	L	T	P	C	Continuous Internal Assessment	End Exam	Total	
		3	0	-	3	40	60	100	
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs				
Course Outcomes : At the end of the course the student will be able to									
CO1: Understand fundamentals of problem solving concepts with various data types and operators									
CO2: Apply conditional and iterative statements for solving a given problem									
CO3: Illustrate the applications of functions and storage classes.									
CO4: Apply the concepts of pointers and dynamic memory management in problem solving.									
CO5: Understand the purpose of structures, unions and files.									
UNIT – I									
General Problem Solving Concepts Algorithm, Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops.									
Imperative Languages Introduction to imperative language; syntax and constructs of a specific language (ANSI C) – Types Operator and Expressions with discussion of variable naming and Hungarian Notation: Variable Names, Data Type and Sizes (Little Endian Big Endian), Constants, Declarations, Arithmetic Operators, Relational Operators, Logical Operators, Type Conversion, Increment Decrement Operators, Bitwise Operators, Assignment Operators and Expressions, Precedence and Order of Evaluation, Formatted input/output.									
UNIT – II									
Control Flow with discussion on structured and unstructured programming Statements and Blocks, If-Else-If, Switch, Loops – while, do, for, break and continue, goto labels, structured and un- structured programming.									
UNIT - III									
Functions and Program Structure with discussion on standard library Basics of functions, parameter passing and returning type, C main return as integer, External, Auto, Local, Static, Register Variables, Scope Rules, Block structure, Initialization, Recursion, Pre-processor, Standard Library Functions and return types.									
UNIT - IV									
Pointers and Arrays Pointers and address, dynamic memory management, Pointers and Function Arguments, Pointers and Arrays, Address Arithmetic, character Pointers and Functions, Pointer Arrays, Pointer to Pointer, Multi-dimensional array and Row/column major formats, Initialization of Pointer Arrays, Command line arguments, Pointer to functions, complicated declarations and how they are evaluated.									
UNIT - V									
Structures and Unions Basic Structure, Structures and Functions, Array of structures, Pointer of structures, Self-referral structures, Table look up, typedef, Unions, Bit-fields.									

Files

Introduction to Files, Opening and Closing files, Reading and Writing files, File I/O functions, Error Handling in files.

Text Books :

1. B. W. Kernighan and D. M. Ritchie, *The C Programming Language*, Second Edition, PHI.
2. B. Gottfried, *Programming in C*, Second Edition, Schaum Outline Series.

Reference Books :

1. Herbert Schildt, *C: The Complete Reference*, Fourth Edition, McGraw Hill.
2. Yashavant Kanetkar, *Let Us C*, BPB Publications.

Question Paper Pattern:

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End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

ENGINEERING CHEMISTRY LAB [CH(P)]

I / II Semester : CE, EEE, ME / ECE					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BS113	BSL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		-	-	3	1.5	40	60	100
End Exam Duration : 2 Hrs								
Course Outcomes : At the end of the course students will be able to								
CO1: Understand and appreciate various analytical methods including instrumentation that acts as tools in the analysis of water.								
CO2: Understand various analytical methods in the analysis of an alloy.								
CO3: Understand various analytical methods including instrumentation that acts as tools in the analysis of different fuels.								
List of Experiments								
<i>Note : At least 12 of the following experiments shall be conducted</i>								
Volumetric Analysis								
1. Demonstration of analytical balance.								
2. Preparation of standard sodium carbonate solution.								
3. Estimation of magnesium by EDTA titration.								
4. Estimation of copper by EDTA titration.								
5. Estimation of total and permanent hardness of water by EDTA titration method.								
6. Estimation of copper in brass alloy.								
7. Estimation of dissolved oxygen by Winkler's method.								
Instrumentation								
8. Determination of calorific value of a solid fuel using Bomb calorimeter.								
9. Determination of viscosity of lubricating oil using Engler's viscometer.								
10. Determination of viscosity of lubricating oil using Redwood viscometer.								
11. Determination of strength of mixture of acids (HCl and CH ₃ COOH) by conductometric titrations.								
12. Verification of Beer-Lamberts law using colorimeter.								
13. Potentiometric titrations.								
14. Determination of simple eutectic of two component system.								

PHONETICS AND COMMUNICATION SKILLS LAB [PCS(P)]

I / II Semester : Common for CE, EEE, ME / ECE, CSE & CST					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
HU103	HSSL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	3	1.5	40	60	100
End Exam Duration: 3 Hrs								
Course Outcomes : At the end of the course, Students will be able to								
CO1: Speak Internationally Intelligible English without mother tongue accent.								
CO2: Adopt appropriate intonation patterns for effective Oral Communication.								
CO3: Identify International Phonetic Symbols to find the pronunciation of new words.								
CO4: Integrate Listening Skills & Speak in English confidently, fluently and effectively.								
CO5: Exhibit team playing & Leadership skills.								
List of Experiments								
Phonetics Laboratory								
Focus in the lab is on accent neutralization for International Intelligibility								
1. Introduction to English Phonetic Symbols and associated sounds.								
2. Practice in Consonant sounds								
3. Practice in Vowel sounds								
4. Practice in Accent, Rhythm and Intonation								
5. Practice sessions on Listening for General Information, Specific Information & Comprehension								
Communication Skills Laboratory								
Focus in the lab is more on fluency than on accuracy								
1. Inter-Personal Communication								
a) Self Introduction								
b) Introducing Others								
c) Non-Verbal Communication								
d) Posture, Gait and Body language								
2. Communication in Formal Situations								
a) Public Speaking – Extempore, Prepared Speech								
b) Role-play								
c) Situational Dialogues								
d) Giving Directions								
e) Sell-out								
f) JAM								
g) Telephone Etiquette								
Reference Books :								
1. <i>Exercises in Spoken English Part –I, Part –II & Part –III</i> , Published by EFLU, Hyderabad.								
2. Dhamija Sethi, <i>A Course in Phonetics and Spoken English</i> , Prentice Hall of India, Pvt.								

Ltd.

3. T. Balasubramanyam A, *Text Book of English Phonetics for Indian Students*, Macmillan India Ltd.

4. Krishna Mohan and Meera Benerjee, *Developing Communication Skills*, Macmillan India Ltd.

5. D. Souza Eunice and Shahani G, *Communication Skills in English*, Noble Publishing House.

PROGRAMING FOR PROBLEM SOLVING LAB [PPS(P)]

I Semester : Common for CE, CSE, CST, ECE, EEE & ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
CS107	ESL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		-	-	3	1.5	40	60	100
End Exam Duration : 3 Hrs								
Course Outcomes : At the end of the course students will be able to								
CO1: Implement programs using conditional and loop statements in C.								
CO2: Develop programs using 1-Dimensional and 2-Dimensional arrays.								
CO3: Perform Call by value, Call by reference and Recursion through functions.								
CO4: Implement programs using pointers.								
CO5: Develop programs using structures and file concepts.								
List of Experiments								
1. Conditional Statements: Quadratic equations, usage of switch statement.								
2. Loop Statements : Adam Number, Cosine series								
3. Arrays: Max Min problem, standard deviation and variance.								
4. Character Arrays: Palindrome, implementation of string handling functions.								
5. Functions and Recursion : Matrix operations, Towers of Hanoi, GCD								
6. Pointers: Interchanging problem, implementation of dynamic memory allocation.								
7. Structures: Usage of structures in various applications.								
8. Files: Reading contents from files and writing contents to files.								
Reference Books :								
1. Yashavanth P. Kanetkar, <i>Let Us C</i> , BPB Publications, 7 th Edition, 2007.								
2. B.W. Kernighan and Dennis M. Ritchie, <i>The C Programming Language</i> , (PHI), 2 nd Edition 2003.								

FOUR YEAR B. Tech. DEGREE COURSE

Scheme of Instruction and Examination

(Effective from 2020–21)

II Semester (CE)

Scheme : 2020

S. No.	Category	Subject	Credits	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
				L	D/T	P	End Exam	CIA Marks	Total
I		<i>Theory</i>							
1	BSC	Engineering Mathematics - II	3	2	1	-	60	40	100
2	BSC	Applied Physics	3	3	-	-	60	40	100
3	ESC	Elements of Building Science	3	3	-	-	60	40	100
4	ESC	Engineering Mechanics	3	2	1	-	60	40	100
5	ESC	Data Structures Through C	3	2	-	2	60	40	100
6	MC	Environmental Studies	-	2	-	-	-	100	100
II		<i>Practical</i>							
7	BSL	Applied Physics Lab	1.5	-	-	3	60	40	100
8	ESL	Computer Aided Civil Engineering Drawing Lab	1.5	-	-	3	60	40	100
9	ESL	Engineering Workshop	1.5	-	-	3	60	40	100
		Total	19.5						

ENGINEERING MATHEMATICS – II (EM2)

II Semester : Common for CSE, CST, CE & ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	Continuous Internal Assessment	End Exam
BS104	BSC	2	1	-	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course the student will be able to								
CO1: Utilize Numerical Methods and principles of least square methods in engineering problems.								
CO2: Determine the Fourier series of a function and its expansion.								
CO3: Understand the Fourier and Z-transforms.								
CO4: Use Partial differential equations and method of separation of variables in solving the one dimensional wave and Heat equations.								
CO5: Understand vector differentiation & integration & its applications.								
UNIT – I								
Numerical Methods Solution of Algebraic and Transcendental Equations – Method of False Position, Iteration method, Newton Raphson method. Solution of Simultaneous Equations – Gauss Seidel iteration method. Curve Fitting – Least squares method. Fitting a straight line $y = a + bx$ and parabola $y = a + bx + cx^2$.								
UNIT - II								
Fourier Series Determination of Fourier coefficients, Dirichlet's conditions. Fourier series of Even and Odd functions. Functions having points of discontinuity. Change of interval. Half-Range Fourier Sine and Cosine series.								
UNIT – III								
Fourier Transforms Infinite Fourier Transforms, Fourier Sine and Cosine transforms. Finite Fourier Sine and Cosine Transforms, Inverse Fourier Transforms. Z-Transforms Z-Transforms, Inverse Z-Transformation, Properties, Damping rule, Shifting rule. Application of Z- Transforms to Difference equations.								
UNIT - IV								
Partial Differential Equations Formation of Partial differential equations by elimination of arbitrary constants and arbitrary functions. Linear equations of first order – Lagrange's Linear equation. Applications - Method of separation of variables. One dimensional Wave equation, One dimensional Heat equation.								
UNIT - V								
Vector Calculus Scalar and Vector point functions. Divergence, curl, gradient, solenoidal and irrotational vectors. Repeated operations by del. Green's theorem, Stoke's theorem and Gauss - Divergence theorem (Statement only). Applications to theorems.								

Text Books:

1. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, 42nd Edition, 2012.
2. T.K.V. Iyengar and others, *A Text Book of Engineering Mathematics*, Vol. I & II, S. Chand & Company, 13th Edition 2014.

Reference Books:

1. B.V. Ramana, *Higher Engineering Mathematics*, TMH Publishers, 2nd Edition, 2006.
2. N.P. Bali and others, *A Text Book of Engineering Mathematics*, Lakshmi publishers, 7th Edition, 2009.
3. Erwyn Kreyszig, *Advanced Engineering Mathematics*, John Wiley, 8th Edition 2006.

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

APPLIED PHYSICS (AP)

II Semester : Common for CSE & CST/ CE, ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	Continuous Internal Assessment	End Exam
BS110	BSC	3	-	-	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course the student will be able to								
CO1: Understand the origin of magnetism, hysteresis, soft and hard magnetic materials; Dielectrics and their characteristics; superconductivity, types, characteristics, Meissner, Josephson effects.								
CO2: Understand the phenomenon of interference, diffraction of light and their applications.								
CO3: Understand the production, detection, properties and applications of ultrasonic waves, determination of velocity of ultrasonic waves in liquids. Principles of quantum mechanics, Schrodinger's equation and its applications.								
CO4: Understand the theory and different production methods of lasers and their applications, different types of optical fibers, losses in fibers and applications of optical fibers.								
CO5: Understand the properties, synthesis, applications of Nanomaterials and Carbon Nanotubes.								
UNIT - I								
Magnetic Materials Introduction – Basic definitions in Magnetism, their relations – Origin of permanent magnetic moment, Bohr magneton – Classification and properties of magnetic materials (Dia, Para, Ferro, Antiferro and Ferri)– Hysteresis, Soft and Hard magnetic materials, Applications								
Dielectrics Introduction - Dielectric polarization, Dielectric Polarizability, Susceptibility and Dielectric constant – Types of Polarizations: Electronic, Ionic, Orientation polarizations – Derivation of Expression for Electronic polarizability – Dielectric Loss – Applications of dielectrics.								
Superconductivity Introduction – Critical Temperature, Critical magnetic field, Critical Current , Meissner effect, Flux quantization – Type – I & Type – II Superconductors, Josephson's effect – Applications of Superconductors – SQUID.								
UNIT - II								
Interference Introduction - Conditions for interference - Interference due to thin uniform film (Reflected light), wedge shaped film, Newton's rings. Applications of interference: Testing of flatness, determination of wavelength, radius of curvature, refractive index of liquid - Non-reflective coatings.								
Diffraction Introduction - Differences between Interference and Diffraction - Types of Diffraction - Fraunhofer diffraction due to single slit, double slit, circular aperture, N-Slits (grating) (qualitative analysis only) - Determination of wavelength using grating - Resolving power, Rayleigh's criterion for resolution, Resolving power of grating and telescope.								

UNIT – III

Ultrasonics

Introduction - Properties of ultrasonics - Production of ultrasonics by Magnetostriction method, Piezoelectric method - Detection of ultrasonics - Determination velocity of ultrasonics in liquids. Applications: SONAR, NDT, general applications.

Quantum Mechanics

Wave – Particle duality; de Broglie Concept of Matter Waves – Properties of Matter Waves – Heisenberg’s Uncertainty Principle. Schrödinger’s Time Independent and Time Dependent Wave equation, Significance of Wave Function - Application of Schrodinger’s equation for : particle in a box (one dimensional problem)

UNIT - IV

Lasers

Spontaneous and Stimulated emission of radiation – Einstein coefficients and their relation - Characteristics of Lasers – Pumping mechanisms – Components of Laser – Ruby, He-Ne and Semiconductor lasers - Applications of Lasers.

Fibre Optics

Principle and propagation of light in Optical fibers – Structure of optical fibres – Acceptance angle – Numerical aperture – Classification of optical fibres – Applications of Optical fibres: Fibre optic communication system, Fibre optic sensors(Temperature, Pressure, Displacement and Water level indicator)– Losses in optical fibres.

UNIT - V

Nanomaterials

Introduction - Significance and Properties of Nano particles - Synthesis Methods: Ball Milling method, Sol-Gel method, CVD method, its applications - PVD method, its applications - Pulsed Laser Deposition method - Wire explosion method - Applications of Nano materials.

Carbon Nano tubes

Properties of Graphene - Classification of CNTs – properties - Synthesis methods: Ball Milling method, CVD method, Arc method, Sputtering - Applications of carbon Nano tubes - Effect of nanotechnology on Environment.

Text Books :

1. M.N. Avadhanulu and P.G. Kshirsagar, *A Text Book of Engineering Physics*, S. Chand & Company
2. V. Rajendran, *Engineering Physics*, McGraw Hill Education (India) Pvt. Limited.
3. K.Vijaya Kumar, *Engineering Physics*, S. Chand & Company
4. S.L.Gupta & S.G.Gupta, *Unified Physics (vol.3) – Electricity, Magnetism and Electronics*, Jai Prakash Nath Publications, Meerut.

Reference Books :

1. Hitendra K. Malik & A.K. Singh, *Engineering Physics*, Tata McGraw Hill Education Pvt. Ltd.
2. P.K Palaniswamy, *Engineering Physics*, SCITECH Publications (India) Pvt. Ltd.
3. R. Murugashan and K.Siva Prasanth, *Modern Physics*, S. Chand & Company

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

ELEMENTS OF BUILDING SCIENCE (EBS)

II Semester : CE					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
CE101	ESC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	-	-	3	40	60	100
Sessional Exam Duration: 1.5 Hrs					End Exam Duration : 3 Hrs			
Course Outcomes: At the end of the course students will be able to								
CO1: Classify and understand the applications of basic building materials.								
CO2: Understand the applications of advanced building materials.								
CO3: Explain the principles and methods of construction of building components.								
CO4: Understand the building services and principles of planning.								
CO5: Understand the bye-laws in planning of residential buildings.								
UNIT - I								
Building materials- I								
Introduction: Importance – Objectives of study of building materials – Classification of construction materials – Properties of materials.								
Stones: Properties of building stones– Relation to their structural requirements – Classification of stones– Dressing of stones –Testing of stones.								
Bricks: Composition of good brick earth – Methods of manufacturing of bricks – Qualities of a good brick –Testing of bricks.								
Lime: Technical terms – Constituents of lime stone – Classification of lime – Manufacturing of lime.								
UNIT - II								
Building Materials- II								
Wood: Structure – Seasoning of timber – Defects in timber.								
Tiles: Characteristics of good tile – Types of tiles – Testing of tiles.								
Other Materials: Properties and uses of iron, glass, ceramics, plastics, steel, aluminum, gypsum and fibre-reinforced plastics.								
UNIT - III								
Building Construction								
Foundations: Shallow foundations – Spread, combined, strap and mat footings.								
Masonry: Bonds in Stone & brick masonry - Partition walls.								
Floors: Materials used – Different types of floors – concrete, tiled floors.								
Roofs: Pitched, flat & curved roofs –RCC roofs.								
Stairs: Terminology – Types of stairs.								
Surface Finishes: Plastering – Pointing – White washing, distempering and Painting – Damp proofing.								
UNIT - IV								
Building Services & Principles of Building Planning								
Ventilation: Necessity – Functional requirements – Natural and mechanical ventilation.								
Lighting: Day and artificial lighting – Types of lighting in working places.								
Fire Protection: Causes – General fire safety requirements – Fire resistant construction.								
Principles of Building Planning: Introduction – Selection of site – Principles of building planning.								
UNIT - V								

Building Regulations and Planning

Building Bye-laws and Regulations: Introduction– Objectives of building bye-laws – Principles underlying building bye-laws – Terminology – Floor area ratio (FAR), Floor space index (FSI) – Classification of buildings as per NBC– Open space requirements – Built up area limitations – Height of the buildings – Wall thickness.

Planning of Residential Buildings: Introduction– Minimum standards for various parts of the buildings – Requirements of different parts and their grouping.

Green Building: Concept of green building – Rating IGBC.

Text Books :

1. S.C. Rangwala, K.S. Rangwala and P.S. Rangwala, *Engineering materials*, Charotar Publishers, Anand.

2. B.C. Punmia, *Building construction*, Laxmi Publications (P) Ltd., New Delhi.

3. Dr. N. Kumara Swamy & A. KameswaraRao, *Building Planning & Drawing*, Charotar Publishers, Anand.

4. Gurucharan Singh and Jagdish Singh, *Building Planning Designing and scheduling*, Standard publishers Distributors.

Reference Books :

1. S.K. Duggal, *Building materials*, New Age international (P) Ltd., New Delhi.

2. N.L. Arora and B.L. Gupta, *Building construction*, Satyaprakshan publications.

3. S.V. Deodhar, *Building science and planning*, Khanna Publishers, New Delhi.

4. Bureau of Indian Standards, *National Building Code of India – 2016*, New Delhi.

5. V.K. Jain, *Automation Systems in smart and Green Buildings*, Khanna Publications.

6. S.C. Rangwala, *Civil Engineering Drawing*, Charotar Publishing House.

Web References:

www.igbs.in

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

ENGINEERING MECHANICS (EGM)

II Semester : Common for CE & ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
CE102	ESC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	-	3	40	60	100
Sessional Exam Duration: 1.5 Hrs					End Exam Duration : 3 Hrs			
Course Outcomes: At the end of the course students will be able to								
CO1: Calculate the resultant of different force systems								
CO2: Determine the unknown forces in determinate structures using equilibrium conditions								
CO3: Determine the axial forces in the members of determinate trusses								
CO4: Understand the concept of friction								
CO5: Determine the centroid and moment of inertia of areas								
CO6: Compute the stresses and strains of axially loaded members, elastic constants of different materials								
UNIT - I								
Forces and Force Systems Types of force systems – Resultant of coplanar, concurrent and non concurrent force systems – Concept of moment – Varignon’s theorem.								
Equilibrium of Systems of Forces Equilibrium concept in mechanics – Free body diagram - Equilibrium of coplanar force systems.								
UNIT - II								
Reactions in Beams Types of loads, supports and beams – Support reactions for simply supported beams, cantilever and overhanging beams subjected to different types of loads.								
Static Analysis of Simple Plane Trusses Analysis of simple trusses by method of joints and method of sections.								
UNIT - III								
Friction Introduction to Friction – Impending Motion – Ladder Friction – Friction in square threaded screws – Simple screw jack. Belt Friction – Friction in flat & V-belt – Ratio of tensions – Power transmission by belts.								
UNIT - IV								
Central Points Concept of first moment – Definition of centroid and centre of gravity – Centroid of composite areas.								
Area Moment of Inertia Moment of inertia for areas – Parallel and perpendicular axis theorems – Moment of inertia of compound sections – Radius of gyration.								
UNIT - V								
Mechanics of Deformable Solids Mechanical properties of materials – Simple stresses and strains – Types of stresses – Hooke’s law – Stress–strain curve for ductile material – Factor of safety and working stress.								
Elastic Constants								

State of simple shear – Complimentary shear stress – Relation between Young’s modulus, Rigidity modulus, Bulk modulus and Poisson’s ratio.

Text Books :

1. R.K. Bansal, *A Text Book of Engineering Mechanics*, Laxmi Publications
2. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Mechanics of Materials*, Laxmi Publications.
3. Basudeb Bhattacharyya, *Engineering Mechanics*, Oxford University Press.

Reference Books :

1. Timoshenko & Young, *Engineering Mechanics*, Tata McGraw–Hill Publications
2. Bhavikatti and Rajasekharappa, *Engineering Mechanics*, New Age Intl. Publications
3. R.K. Rajput, *Applied Mechanics*, Laxmi Publications.
4. A.K. Tayal, *Engineering Mechanics –Statics & Dynamics*, Umesh Publications

Web References:

1. <https://www.coursera.org>
2. www.mathalino.com
3. www.nptel.ac.in/courses

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

DATA STRUCTURES THROUGH C (DSTC)

II Semester : Common for CE and ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
CS105	ESC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	-	2	3	40	60	100
Sessional Exam Duration : 1.5 Hrs					End Exam Duration: 3 Hrs			
Course Outcomes : At the end of the course the student will be able to								
CO1: Understand the concepts of array data structure and its applications								
CO2: Understand the linked list data structure and its operations.								
CO3: Illustrate the operations on stack data structure.								
CO4: Illustrate the operations on queue data structure.								
CO5: Understand the concepts of trees and recursive traversals on binary trees.								
UNIT – I								
Introduction to Data Structures Definition, Classification of Data structures- Linear and Non Linear								
Sequential Storage Representation Arrays, Operations on Arrays- Insertion, Deletion, Traversing; Applications of arrays–Linear Search, Binary Search, Bubble Sort, Selection Sort.								
UNIT – II								
Linked Storage Representation –Linked Lists Introduction, Types of Linked Lists–Single linked list, Double linked list, Operations on linked lists-Traversing, Searching, Insertion and Deletion.								
UNIT – III								
Linear Data Structures – Stacks Representation of Stack using sequential storage and linked allocation methods, Operations on Stacks - Push, Pop, and Display.								
UNIT – IV								
Linear Data Structures - Queues Representation of Queue using sequential and linked allocation, Operations on Queues - Insertion, Deletion and Traversing.								
UNIT – V								
Non Linear Data Structures - Trees Basic terminology, Binary trees, Representation of Binary tree in memory using arrays and linked lists, Binary Search Trees, Recursive Traversals - Preorder, Inorder and Postorder.								
Text Books :								
1. Jean Paul Tremblay and Paul G. Sorenson, <i>An Introduction to Data Structures With Applications</i> , TMH.								
2. Debasis Samantha, <i>Classic Data Structures</i> , Second Edition, PHI.								
Reference Books :								
1. Pradip Dey, Manas Ghosh and Reema Tereja, <i>Computer Programming and Data Structures</i> , Oxford University Press.								

2. S. K. Srivatsava and Deepali Srivatsava, *Data Structures Through 'C' in Depth*, BPB Publications.

Web References :

1. https://www.tutorialspoint.com/data_structures_algorithms
2. <http://www.geeksforgeeks.org/data-structures>

Question Paper Pattern:

Sessional Exam: The question paper for sessional examination is for 25 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. The question paper shall consist of Three Sections with Two Questions (EITHER / OR type) in each section. The student shall answer one question from each section.

End Exam: The question paper for end examination is for 60 marks. It shall consist of Five Units, each containing Two Questions (EITHER / OR type) from each unit of the syllabus, with a weightage of 12 marks. Each of these questions may contain sub-questions. The student shall answer one question from each unit.

DATA STRUCTURES LAB

II Semester : Common for CE and ME	Scheme : 2020
<i>List of Experiments</i>	
1. Array Data Structures: a) Array Operations b) Merging of two sorted arrays.	
2. Applications of Array Data Structures: a) Linear Search b) Binary Search	
3. Applications of Array Data structures: a) Bubble Sort b) Insertion Sort	
4. Implementation of single linked list and its operations	
5. Implementation of double linked lists and its operations	
6. Implementation of stack operations using static allocation	
7. Implementation of stack operations using dynamic allocation	
8. Implementation of queue operations using dynamic allocation	
Reference Books :	
1. Yashavanth P.Kanetkar, <i>Let US C</i> , BPB Publications, 7 th Edition,2007.	
2. B.W. Kernignan and Dennis M.Ritchie, <i>The C Programming Language</i> , (PHI), 2 nd Edition 2003.	

ENVIRONMENTAL STUDIES (ES)

II Semester: Common for ECE, CSE, CST, CE, EEE, ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
MC101	MC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	-	-	-	-	100	-
Course Outcomes : At the end of the course students will be able to								
CO1: Apply the knowledge of environmental issues in his area of work. Understands the need for the conservation of Natural resources for sustainable development.								
CO2: Understands the importance of Ecosystem and conservation of biodiversity								
CO3: Understands the problems due to environmental pollution with remedial measures and issues related to environment.								
CO4: Understands the disaster management in prevention of loss of life and property								
CO5: Understands the use of IT & related technology to conserve environment & human health.								
UNIT – I								
<i>Introduction to Environmental Studies and Natural Resources</i> Definition, scope, importance and multidisciplinary nature of Environmental studies. Need for public awareness. Energy resources – Growing energy needs, nonrenewable and renewable energy resources: Hydroelectric, solar, wind and nuclear energy resources. Water resources – Use and over exploitation of surface and ground water. Dams and its effects on forest and tribal people. Forest resources – uses of forest, deforestation causes and its effects. Food resources- changes caused by agriculture and over grazing. Modern agriculture and its effects.								
UNIT – II								
<i>Concepts of Ecosystem</i> Structure and function of an ecosystem. Energy flow in an ecosystem (single channel energy flow model). Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristics and functions of grasslands, desert, pond and ocean ecosystems.								
UNIT – III								
<i>Biodiversity and its Conservation</i> Definition and levels of biodiversity. Values of biodiversity – consumptive, productive, social, ethical, aesthetic and ecological services. Hot spots of biodiversity. Biogeographical classification of India. Endangered and endemic species of India. Threats to biodiversity – Habitat loss, poaching of wild life and man-wild life conflict. Conservation strategies- In situ and ex situ conservation.								
UNIT – IV								
<i>Environmental Pollution</i> Air Pollution - sources, types, causes and Effects of air pollutants on humans, plants and animals. Global effects – global warming, acid rains and ozone layer depletion. Air Pollution control measures for suspended particulate matter (SPM) and gaseous pollutants. Water Pollution – sources, causes and effects of water pollution. Sewage water treatment. Disaster management – Floods, Earth quake and cyclone .Municipal solid waste management. Role of an individual in prevention of pollution.								

UNIT – V

Social Issues and the Environment

From unsustainable development to sustainable development. Consumerism and waste products. Salient features of Air Act, water Act and Forest conservation Act. Process involved in the enforcement of environmental legislation. Role of Information Technology in environment and human health.

Text books

1. C.P.Kaushik and Anubha Kaushik, *Environmental Studies*, New Age International (P)Ltd., New Delhi
2. R. Rajagopalan, *Environmental Studies*, Oxford University Press, Chennai
3. Y. Anjaneyulu, *Introduction to Environmental sciences*, BS Publications, Hyderabad

Reference books

1. Benny Joseph, *Environmental Studies*, Tata McGraw Hill, New Delhi.
2. Barucha Erach, *Environmental Studies*, Universities Press.

APPLIED PHYSICS LAB [AP(P)]

I / II Semester : Common for ECE, CSE, CST / CE, ME, EEE					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BS114	BSL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		-	-	3	1.5	40	60	100
End Exam Duration: 2 Hrs								
Course Outcomes: At the end of the course students will be able to								
CO1: Apply the knowledge of physics laboratory in measuring the standard values.								
CO2: Apply theoretical knowledge to experimental values.								
List of Experiments								
<i>Note : At least 12 of the following experiments shall be conducted</i>								
1. Determination of size of small particles using a laser.								
2. B-H curve to study the magnetic behavior of ferromagnetic materials.								
3. Determination of Numerical Aperture of an Optical Fiber.								
4. Verification of Faraday's Laws.								
5. Determination of wavelength using a single slit.								
6. Study of magnetic field along the axis of a circular coil (Steward Gees Apparatus).								
7. LCR Series and Parallel Resonance.								
8. Determination of wavelengths using a grating.								
9. Hall Effect-determination of Hall coefficient and charge density.								
10. Determination of radius of curvature of a plano-convex lens using Newton's rings.								
11. Double refraction - determination of refractive indices of e-ray and o-ray.								
12. Determination of small thickness by forming parallel fringes.								
13. Determination of rigidity modulus by using torsion pendulum.								
14. Determination of energy gap of a semiconductor by four probe method.								

COMPUTER AIDED CIVIL ENGINEERING DRAWING LAB [CACED(P)]

II Semester : CE					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
CE103	ESL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		-	-	3	1.5	40	60	100
					End Exam Duration : 3 Hrs			
Course Outcomes: At the end of the course students will be able to								
CO1: Develop Parametric design and the conventions of formal civil engineering drawings.								
CO2: Understand the use and application of Auto-cad commands								
CO3: Draw a line diagram of Office, Health centre and Library Buildings.								
CO4: Draw the Plan and Sectional views of residential and Industrial buildings								
CO5: Draw detailing of reinforcement in structural elements								
Introduction: Introduction to concept of drawings – Interpretation of typical drawings – Planning drawings to show information concisely and comprehensively – Optimal layout of drawings and Scales – Introduction to computer aided drawing – Coordinate systems – Reference planes.								
Commands: Initial settings – Format – Drawing aids – Drawing basic entities – Modify commands – Layers – Text and Dimensioning – Blocks – Drawing presentation norms and standards – Printing from layout tabs								
Building Drawing: Terms – Elements of building planning and drawing – Methods of making line drawing and detailed drawing – Site plan, floor plan, elevation and section drawing of small residential buildings – Use of notes to improve clarity.								
List of Experiments								
1. Line diagram of office building.								
2. Line diagram of educational Institute and residential building								
3. Doors and Windows.								
4. Calculation of area and perimeter of closed traverse.								
5. Plan, section and elevation of residential building.								
6. Plan, section and elevation of multi-Storied building.								
Reference Books :								
1. N. Kumara Swamy & A. Kameswara Rao, <i>Building Planning & Drawing</i> , Charotar Publishers, Anand.								
2. Gurucharan Singh and Jagdish Singh, <i>Building Planning Designing and scheduling</i> , Standard Publishers Distributors.								
3. MuneerHamad, <i>AutoCAD Beginning And Intermediate</i> , (Mercury Learning and Information LLC) Stylus Publishing.								
4. George Omura, <i>Mastering AutoCAD and AutoCAD LT</i> , Wiley India Pvt. Ltd, Delhi.								

ENGINEERING WORKSHOP [EW(P)]

II Semester : Common for CE & ME					Scheme : 2020			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ME102	ESL	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	3	1.5	40	60	100
End Exam Duration: 3 Hrs								
Course Outcomes : At the end of the course students will be able to								
CO1: To understand the usage of tools and equipments in fitting, carpentry, house wiring, soldering, Foundry and smithy.								
CO2: To prepare of simple models in carpentry, fitting and smithy								
CO3: To prepare sand mould using foundry tools								
CO4: To do soldering of circuit boards and								
CO5: To give electrical connections in house wiring.								
LIST OF EXPERIMENTS								
Introduction to tools and equipment used in each trade								
Cycle – I (Carpentry)								
1. Dovetail joint								
2. Mitre-faced Bridle joints								
3. Mortise and Tenon joint								
Cycle – II (Fitting)								
1. V – fitting								
2. Stepped fitting								
3. Half round fitting								
Cycle – III (Black smithy and Foundry)								
1. Making Round to square cross section								
2. Making eye bolt								
3. Preparation of mould with split piece pattern.								
Cycle – IV (House wiring)								
1. One bulb controlled by one-way switch and two-way switches.								
2. Two bulbs in series and parallel								
Cycle – IV (Soldering)								
1. Soldering Practice								
2. Soldering Resistances in Series								
3. Soldering Resistances in parallel								
Student has to perform at least two jobs from each trade.								
Reference Books :								
1. P. Kannaiah and K.L. Narayana, <i>Workshop Manual</i> , Second Edition, Scitech Publication, Chennai								
2. K.Venkata Reddy, <i>First year Workshop manual</i> , Bhagyasri Publishers, Tirupathi								
3. Hazra chowdhury and S.K. Bose, <i>Workshop Technology Vol.</i> , Media Promoters and Publication, NewDelhi.								