

**COMPUTER SCIENCE AND ENGINEERING (CSE(AIML) & CSE(DS))****FOUR YEAR B.TECH. DEGREE COURSE**

Scheme of Instruction and Examination

**I SEM (CSE(AIML) & CSE(DS))****Scheme-2020**

S. No	Category	Course Title	Credits	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
				L	T	P/D	End Exam Marks	CIA Marks	Total Marks
<b>I</b>		<b><u>Theory</u></b>							
1.	BSC	Engineering Mathematics- I	3	2	1		60	40	100
2.	BSC	Probability & Statistical Methods	3	2	1		60	40	100
3.	HSSC	English	3	3			60	40	100
4.	ESC	Electronic Devices and Circuits	3	3			60	40	100
5.	ESC	Programming for Problem Solving	3	3			60	40	100
6	Audit	English Proficiency Course				3	-	-	-
<b>II</b>		<b><u>Practical</u></b>							
7	ESL	Electronic Devices and Circuits 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
		<b>Total</b>	<b>19.5</b>						

**II SEM CSE(AIML) & CSE(DS))****Scheme-2020**

S. No	Category	Course Title	Credits	Scheme of Instruction periods/week			Scheme of Examination Maximum Marks		
				L	T	P/D	End Exam Marks	Internal Assessment Marks	Total Marks
<b>I</b>		<b><u>Theory</u></b>							
1.	BSC	Engineering Mathematics- II	3	2	1		60	40	100
2.	BSC	Applied Physics	3	3			60	40	100
3.	ESC	Elements of Electrical Engineering	3	3			60	40	100
4.	ESC	Engineering Drawing	3	1	-	4	60	40	100
5.	ESC	Data Structures	3	3			60	40	100
6	MC	Environmental Studies		2			-	100	100
<b>II</b>		<b><u>Practical</u></b>							
7	BSL	Applied Physics Lab	1.5			3	60	40	100
8	BSL	Statistical Methods Lab	1.5			3	60	40	100
9	ESL	Data structures lab	1.5			3	60	40	100
		<b>Total</b>	<b>19.5</b>						

## ENGINEERING MATHEMATICS – I (EM1)

<b>I Semester</b> : Common for CSE, CST, CE , ME, CSE(AIML) & CSE(DS)					<b>Scheme : 2020</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS101	BSC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		<b>2</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes</b> : At the end of the course the student will be able to								
<b>CO1:</b> Find the solution for simultaneous system of linear equations and eigen values and eigen vectors.								
<b>CO2:</b> Solve first order differential equations and its applications.								
<b>CO3:</b> Solve higher order differential equations and its applications.								
<b>CO4:</b> Understand Rolle's and Lagrange's mean value theorems. Evaluate maxima & minima and areas and volumes by multiple integrals.								
<b>CO5:</b> Learn Laplace transform of a function and solve the differential equations using Laplace Transforms								
<b>UNIT – I</b>								
<b>Matrices</b> 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								
<b>UNIT - II</b>								
<b>Differential Equations</b> 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.								
<b>UNIT – III</b>								
<b>Higher Order Differential Equations</b> 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.								
<b>UNIT – IV</b>								
<b>Differential Calculus</b> Rolle's theorem, Lagrange's mean value theorem. Maxima and minima of functions of two variables.								
<b>Multiple Integrals</b> Double integrals, change of order of integration, Change to polar coordinates. Area and volume by double integration. Triple integrals, volume by triple integrals.								
<b>UNIT - V</b>								
<b>Laplace Transforms</b> 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, 42<sup>nd</sup> Edition, 2012
2. T.K.V.Iyengar and others -A Text Book of Engineering Mathematics, Vol I & II - S.Chand & Company, 13<sup>th</sup> Edition 2014

**Reference Books**

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

**Question Paper Pattern:****Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## PROBABILITY & STATISTICAL METHODS (PSM)

<b>I/II Semester</b> : Common for CSE,CST, CSE(AIML) & CSE(DS)					<b>Scheme : 2020</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS106	BSC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		<b>3</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes</b> : At the end of the course the student will be able to								
<b>CO1:</b> Gain the knowledge on Mathematical Statistics and probability theory.								
<b>CO2:</b> Classify discrete and continuous distributions.								
<b>CO3:</b> Understand the test of hypothesis for large samples.								
<b>CO4:</b> Analyze the Test of significance for small samples.								
<b>CO5:</b> Find correlation coefficient and classification of ANOVA.								
<b>UNIT – I</b>								
<b>Statistical Methods:</b> Introduction to statistics, Frequency distribution, Measures of Central Tendency, Measures of dispersion, Moments.								
<b>Probability:</b> Basic concepts of probability, Addition and Multiplication law of probability, Mathematical Expectation -Variance and Co-variance.								
<b>UNIT - II</b>								
<b>Probability Distributions:</b> Random variable – Discrete and continuous probability distributions and Functions; Binomial, Poisson and Normal distributions.								
<b>UNIT – III</b>								
<b>Test of Hypothesis:</b> Population and sample, Confidence interval of mean, Statistical hypothesis –Null and Alternative hypothesis, Level of Significance and Critical region, Z-test for means and Proportions.								
<b>UNIT - IV</b>								
<b>Test of Significance:</b> Student t-test - sample mean, difference between sample means and paired Student t-test, F – test, Chi-square test –Goodness of fit and independence of attributes.								
<b>UNIT - V</b>								
<b>Correlation:</b> Co-efficient of Correlation, Lines of regression and Rank Correlation.								
<b>Analysis of Variance:</b> ANOVA for One-way classification, ANOVA for Two-way classification.								
<b>Text Books</b>								
1. Gupta and Kapur Fundamentals of Mathematical Statistics; S. Chand & Company, New Delhi.								
2. T.K.V.Iyengar and others -Probability And Statistics, S.Chand & Company, 5 <sup>th</sup> Edition, 2015.								
3. B.S.Grewal [2012], Higher Engineering Mathematics, Khanna Publishers, New Delhi.								
<b>Reference Books</b>								
1. K.Murugesan & P.Gurusamy , Probability And Statistics , Anuradha Publications.								
2. Probability And Statistics, Murray R Spiegel and others, Schaum’s series, Tata Mcgraw Hill Education.								
3. Leonard Kazmier , Business Statistics , Schaum’s series, Tata Mcgraw Hill Education.								

**Question Paper Pattern:****Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

**ENGLISH (ENG)**

<b>I/II Semester : Common for CE, EEE, ME/ ECE, CSE , CST, CSE(AIML) &amp; CSE(DS)</b>						<b>Scheme : 2020</b>		
<b>Course Code</b>	<b>Category</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
HU101	HSSC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		3	-	-	3	40	60	100
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes:</b> At the end of the course, Students will be able to								
<b>CO 1:</b> Use Grammatically acceptable English in Oral and Written communication.								
<b>CO 2:</b> Use appropriate Vocabulary in Technical and General Contexts.								
<b>CO 3:</b> Comprehend General and Technical Content using various Reading Skills like Skimming and Scanning.								
<b>CO 4:</b> Write Letters, Summaries and Essays of topical, Narrative, Descriptive, Analytical and Persuasive nature.								
<b>CO 5:</b> Write Job Applications, Resumes, Memos and E-mails.								
<b>UNIT – I</b>								
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								
<b>UNIT – II</b>								
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								
<b>UNIT – III</b>								
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 Resume Preparation								
<b>UNIT – IV</b>								
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. The Enriched Reading by D. Sudha Rani, 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, 3<sup>rd</sup> Edition, OUP, 2015.
5. Raj N Bakshi, English Grammar Practice, Orient BlackSwan, 2005.
6. Sangeeta Sharma & Binod Mishra, Communication Skills for Engineers and Scientists, PHI Learning Private Limited.
7. M. Ashraf Rizvi, Effective Technical Communication, TataMcGraw-Hill Publishing Company Ltd., 2005.
8. Dr A. Ramakrishna Rao, Dr G. Natanam & Prof 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

## ELECTRONIC DEVICES AND CIRCUITS (EDC)

I/II Semester : ECE,CSE,CST, CSE(AIML) & CSE(DS) /EEE						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EC101	ESC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		3	-	-	3	40	60	100
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes :</b> At the end of the course the students are able to								
<b>CO1:</b> Understand the concepts of energy band diagrams and semiconductors.								
<b>CO2:</b> Apply the concept of diode in rectifiers, filter circuits and wave shaping.								
<b>CO3:</b> Analyze the operation and configurations of BJT.								
<b>CO4:</b> Analyze the operation and characteristics of JFET.								
<b>CO5:</b> Analyze the operation and characteristics of MOSFET and special devices.								
<b>UNIT – I</b>								
<b>Review of Semiconductor materials</b>								
Classification of materials based on Energy Band Diagrams, mobility & conductivity of Charge carriers in Semiconductors, Continuity equation, Intrinsic and Extrinsic semiconductors, Mass-action law, Charge densities in semiconductors, Drift current & diffusion current, Hall-effect.								
<b>UNIT - II</b>								
<b>Semiconductor Diodes And Applications</b>								
p-n junction Diode - Construction and V-I Characteristics ,Current components in p-n diode, Diode resistance, Diode as a Rectifier-HWR,FWR and Bridge Rectifier With and Without Filters, Clipping and Clamping circuits without biasing, Break down mechanisms, Zener diode characteristics and its Applications.								
<b>UNIT – III</b>								
<b>Bipolar Junction Transistor (BJT)</b>								
Construction and operation of n-p-n and p-n-p transistors, Transistor current components, CB, CE and CC configurations, characteristics and their comparisons, Transistor Biasing, Transistor as an amplifier.								
<b>UNIT – IV</b>								
<b>Field Effect Transistors (FET)</b>								
Construction, Types and operation of JFETs, Drain and Transfer characteristics, Parameters of JFET, JFET Biasing, Comparison of JFET and BJT, Applications of JFET.								
<b>UNIT - V</b>								
<b>MOSFETs and Special Purpose Devices</b>								
<b>MOSFETs:</b> Introduction of MOSFETs, Types of MOSFETs. Characteristics of Depletion MOSFET and Enhancement MOSFET.								
<b>Special Purpose Devices:</b> LED, Photo diode, UJT, SCR and working Principle of solar cell.								
<b>Text Books</b>								
1. Jacob Millman, Christos C Halkias, Satyabrata Jit, “Integrated Electronic”, 2nd Edition, TMH, 2012.								
2. Ben G Streetman and Sanjay Banerjee, “Solid State Electronic Devices”, 5th Edition, Pearson Education Asia, 2002.								
3. Robert L Boylestad, Louis Nashelsky, “Electronic devices and Circuit theory”, 8th Edition, PHI Pvt. Ltd., 2004.								
4. Donald A Neamen and Dhruves Biswas, “Semiconductor Physics and Devices”, 4th Edition TMH,								



2012.

5. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th edition, 2008

### **Reference Books**

1. N.N Bhargava, D.C. Kulshrestha, S.C Gupta, NITTTR – Chandigarh, Basic Electronics and Linear Circuits, McGraw Hill Education ( India), Pvt. Ltd., 2nd Edition, 2017.
2. Adel S. Sedra and Kenneth C. Smith, Microelectronic Circuits, Oxford University Press, 7th Edition, 2018.
3. Jacob Millman and Arvin Gabriel, Microelectronics- 2nd Edition, McGraw Hill, 2013.
4. A S Sedra and K C Smith, Microelectronics, 7th Edition, Oxford University Press, 2018.
5. Albert Paul Malvino, Electronic Principles, McGraw Hill International edition.

### **Web References**

1. <http://www.electronics-tutorials.ws/>
2. <http://nptel.ac.in/courses/117103063/>
3. [www.electronicshub.org/tutorials/](http://www.electronicshub.org/tutorials/)
4. [engineering.nyu.edu/gk12/amps-cbri/pdf/Basic%20Electronics.pdf](http://engineering.nyu.edu/gk12/amps-cbri/pdf/Basic%20Electronics.pdf)

### **Question Paper Pattern:**

#### **Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## PROGRAMMING FOR PROBLEM SOLVING (PPS)

<b>I Semester : Common for CE,CSE,CST, ECE,EEE , ME ,CSE(AIML) &amp; CSE(DS)</b>					<b>Scheme : 2020</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS101	ESC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		<b>3</b>	<b>0</b>	<b>-</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes :</b> At the end of the course the student will be able to								
<b>CO1:</b> Understand fundamentals of problem solving concepts with various data types and operators								
<b>CO2:</b> Apply conditional and iterative statements for solving a given problem								
<b>CO3:</b> Illustrate the applications of functions and storage classes.								
<b>CO4 :</b> Apply the concepts of pointers and dynamic memory management in problem solving.								
<b>CO5:</b> Understand the purpose of structures, unions and files.								
<b>UNIT – I</b>								
<b>General Problem Solving Concepts:</b> Algorithm, Flowchart for problem solving with Sequential Logic Structure, Decisions and Loops.								
<b>Imperative Languages:</b> 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.								
<b>UNIT – II</b>								
<b>Control Flow with discussion on structured and unstructured programming:</b> Statements and Blocks, If-Else-If, Switch, Loops – while, do, for, break and continue, goto labels, structured and un- structured programming.								
<b>UNIT - III</b>								
<b>Functions and Program Structure with discussion on standard library:</b> 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.								
<b>UNIT - IV</b>								
<b>Pointers and Arrays:</b> 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.								
<b>UNIT - V</b>								
<b>Structures and Unions:</b> Basic Structure, Structures and Functions, Array of structures, Pointer of structures, Self-referral structures, Table look up, typedef, Unions, Bit-fields.								
<b>Files:</b> Introduction to Files, Opening and Closing files, Reading and Writing files, File I/O functions, Error Handling in files.								

**Text Books :**

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

**Reference Books :**

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

**Question Paper Pattern:****Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## ELECTRONIC DEVICES AND CIRCUITS LAB (EDC (P))

I/II Semester : CSE,CST, CSE(AIML) & CSE(DS) / EEE					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	Continuous Internal Assessment	End Exam
EC103	ESL	-	-	3	1.5	40	60	100
<b>End Exam Duration: 3 Hrs</b>								
<b>Course Outcomes :</b> At the end of the course, students are able to								
<b>CO1:</b> Understand the operation of electronic equipments - CRO, CDS and FG.								
<b>CO2:</b> Analyze the characteristics and applications of PN-diode and Zener diode.								
<b>CO3:</b> Understand the characteristics of BJT.								
<b>CO4:</b> Understand the characteristics of JFET.								
<b>List of Experiments</b>								
Note : At least 12 of the following experiments shall be conducted								
1. Study of Electronic equipment - CRO, CDS and FG.								
2. P-N Junction Diode V-I Characteristics.								
3. Zener Diode V-I Characteristics.								
4. Zener diode as a voltage regulator.								
5. Performance characteristics of half wave rectifier.								
6. Performance characteristics of full wave rectifier.								
7. Performance characteristics of bridge rectifier.								
8. Clipping circuits using diodes.								
9. Clamping circuits using diodes.								
10. Common emitter input-output characteristics.								
11. Common base input-output characteristics.								
12. JFET drain and transfer characteristics.								
13. SCR characteristics.								
14. UJT characteristics.								
15. UJT as relaxation oscillator								

## PHONETICS & COMMUNICATION SKILLS LAB (PCSP)

<b>I/II Semester : Common for CE, EEE, ME/ ECE, CSE, CST, CSE(AIML) &amp; CSE(DS)</b>						<b>Scheme : 2020</b>		
<b>Course Code</b>	<b>Category</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
		<b>L</b>	<b>T</b>	<b>P</b>		<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>
<b>HU103</b>	HSSL	<b>0</b>	<b>0</b>	<b>3</b>	<b>1.5</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>End Exam Duration: 2 Hrs</b>								
<b>Course Outcomes :</b> At the end of the course, Students will be able to								
<b>CO1:</b> Speak Internationally Intelligible English without mother tongue accent.								
<b>CO2:</b> Adopt appropriate intonation patterns for effective Oral Communication.								
<b>CO3:</b> Identify International Phonetic Symbols to find the pronunciation of new words.								
<b>CO4:</b> Integrate Listening Skills & Speak in English confidently, fluently and effectively.								
<b>CO5:</b> Exhibit team playing & Leadership skills.								
<b>List of Experiments</b>								
<b>Phonetics Laboratory</b>								
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,								
<b>Communication Skills Laboratory</b>								
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								
<b>Reference Books :</b>								
1. Exercises in Spoken English Part – I, Part – II & Part – III Published by EFLU, Hyderabad.								
2. A Course in Phonetics and Spoken English, Dhamija Sethi, 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)]

<b>I Semester : Common for CE, CSE, CST, ECE, EEE , ME, CSE(AIML) &amp; CSE(DS)</b>					<b>Scheme : 2020</b>			
Course Code	Category	Hours / Week			Credits	Maximum Marks		
<b>CS107</b>	<b>ESL</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>Total</b>
		-	-	3	1.5	40	60	100
<b>End Exam Duration : 3 Hrs</b>								
<b>Course Outcomes :</b> At the end of the course students will be able to								
<b>CO1:</b> Implement programs using conditional and loop statements in C.								
<b>CO2:</b> Develop programs using 1-Dimensional and 2-Dimensional arrays.								
<b>CO3:</b> Perform Call by value, Call by reference and Recursion through functions.								
<b>CO4:</b> Implement programs using pointers.								
<b>CO5:</b> Develop programs using structures and file concepts.								
<b>List of Experiments</b>								
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.								
<b>Reference Books :</b>								
1. Yashavanth P.Kanetkar , Let US C , BPB Publications, 7 <sup>th</sup> Edition,2007.								
2. B.W. Kernignan and Dennis M.Ritchie, The C Programming Language , (PHI), 2 <sup>nd</sup> Edition 2003.								

## ENGINEERING MATHEMATICS – II (EM2)

<b>II Semester</b> : Common for CSE, CST, CE , ME, CSE(AIML) & CSE(DS)					<b>Scheme : 2020</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS104	BSC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		2	1	-	3	40	60	100
<b>Sessional Exam Duration : 1½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes</b> : At the end of the course the student will be able to								
<b>CO1:</b> Utilize Numerical Methods and principles of least square methods in engineering problems.								
<b>CO2:</b> Determine the Fourier series of a function and its expansion.								
<b>CO3:</b> Understand the Fourier and Z-transforms.								
<b>CO4:</b> Use Partial differential equations and method of separation of variables in solving the one dimensional wave and Heat equations.								
<b>CO5:</b> Understand vector differentiation & integration and its applications.								
<b>UNIT – I</b>								
<b>Numerical Methods</b> 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 $y = a + bx + cx^2$ .								
<b>UNIT - II</b>								
<b>Fourier Series</b> 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.								
<b>UNIT – III</b>								
<b>Fourier Transforms</b> Infinite Fourier Transforms, Fourier Sine and Cosine transforms. Finite Fourier Sine and Cosine Transforms, Inverse Fourier Transforms. <b>Z-Transforms</b> Z-Transforms, Inverse Z-Transformation, Properties, Damping rule, Shifting rule. Application of Z- Transforms to Difference equations.								
<b>UNIT - IV</b>								
<b>Partial Differential Equations</b> 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.								
<b>UNIT - V</b>								
<b>Vector Calculus</b> 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, 42<sup>nd</sup> Edition, 2012.
2. T.K.V. Iyengar and others - A Text Book of Engineering Mathematics, Vol. I & II - S.Chand & Company, 13<sup>th</sup> Edition 2014.

**Reference Books**

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

**Question Paper Pattern:****Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.



## APPLIED PHYSICS (AP)

I /II Semester : Common for CSE,CST, ECE / CE,ME,EEE , CSE(AIML) & CSE(DS)					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS110	BSC	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	-	-	3	40	60	100
Sessional Exam Duration : 1 ½ Hrs.					End Exam Duration: 3 Hrs.			
Course Outcomes : At the end of the course students will be able to								
<b>CO1:</b> Understand the origin of magnetism, hysteresis, soft and hard magnetic materials; Dielectrics and their characteristics; superconductivity, types, characteristics, Meissner, Josephson effects.								
<b>CO2:</b> Understand the phenomenon of interference, diffraction of light and their applications.								
<b>CO3:</b> 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.								
<b>CO4:</b> 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.								
<b>CO5:</b> Understand the Properties, synthesis, applications of Nanomaterials and Carbon Nanotubes.								
<b>UNIT – I</b>								
<b>Magnetic Materials:</b> 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								
<b>Dielectrics:</b> 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.								
<b>Superconductivity:</b> Introduction – Critical Temperature, Critical magnetic field, Critical Current , Meissner effect, Flux quantization – Type – I & Type – II Superconductors, Josephson's effect – Applications of Superconductors – SQUID.								
<b>UNIT – II</b>								
<b>Interference:</b> 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.								
<b>Diffraction:</b> 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.								
<b>UNIT – III</b>								
<b>Ultrasonics:</b> 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.								
<b>Quantum Mechanics:</b> 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. Dr. 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 Er.K.Siva Prasanth, Modern Physics, S. Chand & Company

#### **Question Paper Pattern:**

##### **Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## ELEMENTS OF ELECTRICAL ENGINEERING (EEE)

I/II Semester : Common for ECE, CSE, CST / ME, CSE(AIML) & CSE(DS)					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EE101	ESC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		<b>2</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>40</b>	<b>60</b>	<b>100</b>
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes :</b> At the end of the course students will be able to								
<b>CO1:</b> Understand the basic essentials of DC circuits.								
<b>CO2:</b> Understand the basic essentials of AC circuits.								
<b>CO3:</b> Understand the construction and working of DC machines.								
<b>CO4:</b> Understand the construction and working of transformers, induction motors and AC generators.								
<b>CO5:</b> Understand the basics of illumination and earthing.								
<b>UNIT – I</b>								
<b>DC Circuits:</b> Definition of current, potential, resistance, power and energy, symbol and units, Ohm’s law, Kirchhoff’s laws, solution of series, parallel and series parallel circuits, analysis of circuits using loop current method and node voltage method, source transformation. (Elementary treatment only) (Simple problems only).								
<b>UNIT – II</b>								
<b>AC Circuits:</b> Instantaneous, average, r.m.s and maximum values of sinusoidal wave, concept of phase and phase difference, Phasor representation of sinusoidal wave, A.C through pure resistance, pure inductance and pure capacitance, Series R-L-C Circuits (Simple Problems), power factor, concept of 3- $\Phi$ system - voltage and current relations in star and delta connections (No derivation -Problems with R load only - Elementary treatment only)								
<b>UNIT – III</b>								
<b>DC Machines:</b> Electromagnetic Induction, Faraday’s law, Lenz’s law and Flemings rules, Construction and working principle of a DC machine, emf equation of a D.C Generator, DC motor principle, voltage equation of generator and motor (Elementary treatment only-Simple Problems).								
<b>UNIT – IV</b>								
<b>Transformers:</b> Working principle and construction of 1- $\Phi$ Transformer, transformer ratio, emf equation (Elementary treatment only) (Simple problems). <b>Induction Motors:</b> Construction and principle of operation of induction motor, slip (Elementary treatment only) (Theoretical aspects only). <b>AC Generators</b> Construction, EMF equation (Elementary treatment only) (Theoretical aspects only).								
<b>UNIT – V</b>								
<b>Illumination:</b> Units and laws of Illumination, Types of lamps, Incandescent lamps, Fluorescent lamps and Sodium-vapour lamps. (elementary treatment only). <b>Earthing:</b> Difference between neutral wire and earth wire, Concept of earthing, applications of fuse and MCB’s, electrical shock, precautions against shock, treatment of electrical shock. (elementary treatment only).								
<b>Text Books :</b>								
1. V.K.Mehta and Rohith Mehta, “Basic electrical engineering”, S.Chand publishers, 14th edition.								
2. M.S. Naidu and S. Kamakshiah, “Introduction to Electrical Engineering”, Tata McGraw Hill Publishers, 1st edition, 2004.								
3. B.L. Thereja, “Electrical technology-Vol-I & II”, S. Chand Publishers, 23rd edition, 2004.								
4. Dr.S.L.Uppal, “Electrical Wiring, Estimating and Costing”, Khanna publishers, 1st edition, 2008.								

<b>Reference Books :</b>
1. H. Cotton, “Electrical Technology”, CBS Publishers, 7th edition, 2005.
2. Joseph Edminister, “Electric Circuits” Tata McGraw Hill Publishers, 5th edition, 2010.
3. K.B.Raina and S.K.Battacharya, “Electrical Design Estimating and Costing” New age publishers, 1st edition, 1991.
<b>Question Paper Pattern:</b>
<b>Sessional Exam :</b>
The question paper for sessional examination shall be 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.
<b>End Examination:</b>
The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## ENGINEERING DRAWING (ED)

I / II Semester : Common to CE, ECE,ME/ CSE,CST, EEE, CSE(AIML) & CSE(DS)						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ME101	ESC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		1	-	4	3	40	60	100
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes :</b> At the end of the course students will be able to								
<b>CO1:</b> Understand the concept of projections of an object and draw the projection of points, straight lines and planes								
<b>CO2:</b> Draw projection of regular solids								
<b>CO3:</b> Draw the sectional views of regular solids and their surface developments								
<b>CO4:</b> Draw the orthographic views from given isometric view								
<b>CO5:</b> Draw the isometric views from the orthographic views								
<b>UNIT – I</b>								
<b>Introduction to Engineering Drawing:</b> Drawing instruments and their uses, Lettering and Dimensioning. Introduction to polygons and conics. Introduction to scales ( <b>not for End examinations</b> )								
<b>Orthographic projections:</b> 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)								
<b>Projection of planes:</b> Regular planes- perpendicular, parallel to one reference plane and inclined to other reference planes - Inclined to both the reference planes								
<b>UNIT – II</b>								
<b>Projections of solids:</b> Projections of right regular solids- prism, pyramid, cylinder and cone with axis inclined to one plane and inclined to both planes.								
<b>UNIT – III</b>								
<b>Sections of Solids:</b> Sectional views of right regular solids - prism, pyramid, cylinder and cone. True shapes of Sections (Treatment is limited to simple problems only)								
<b>Development of Surfaces:</b> Development of surfaces of right regular solids and their sections - prism, pyramid, cylinder and cone.								
<b>UNIT – IV</b>								
<b>Orthographic projections:</b> Conversion of pictorial views into orthographic views (Treatment limited to simple problems only)								
<b>UNIT – V</b>								
<b>Isometric Projections:</b> Principle of Isometric projection, Isometric scale. Isometric projections of simple planes, regular solids and compound solids.								

**Text Books**

1. K.L.Narayana and P.Kannaiah“ Text book on Engineering Drawing,” Second Edition Scitech Publications, Chennai.,2006
2. N.D.Bhatt and V.M.Panchal,“ Elementary Engineering Drawing “, 45<sup>th</sup> 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 Mc Graw-Hill Publishing Company Ltd. , New Delhi , 2008
3. M.B.Shaw & B.C.Rana “ Engineering Drawing “Second Edition Pearson Education , New Delhi, 2009

**Question Paper Pattern:****Sessional Exam :**

The question paper for sessional examination shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.

## DATA STRUCTURES (DS)

<b>II Semester : Common for CSE,CST,ECE , EEE, CSE(AIML) &amp; CSE(DS)</b>					<b>Scheme : 2020</b>			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS104	ESC	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		3	-	-	3	40	60	100
<b>Sessional Exam Duration : 1 ½ Hrs</b>					<b>End Exam Duration: 3 Hrs</b>			
<b>Course Outcomes :</b> At the end of the course the student will be able to								
<b>CO1:</b> Understand the purpose of array data structure and its applications								
<b>CO2:</b> Understand the linked list data structure and its operations.								
<b>CO3:</b> Illustrate the operations performed on stack data structure.								
<b>CO4:</b> Illustrate the operations performed on queue data structure								
<b>CO5:</b> Understand the concepts of trees and operations on binary search trees.								
<b>UNIT – I</b>								
<b>Introduction to Data Structures</b> Definition, Classification of Datastructures- Linear and Non Linear <b>Sequential Storage Representation</b> Arrays, Operations on Arrays- Insertion, Deletion, Traversing; Applications of arrays–Linear Search, Binary Search, Bubble Sort, Selection Sort, Insertion Sort, Merging of arrays.								
<b>UNIT – II</b>								
<b>Linked Storage Representation –Linked Lists</b> Linked storage representation using pointers, Types of Linked Lists–Single linked list, Double linked list, Operations on linked lists-Traversing, Searching, Insertion and Deletion.								
<b>UNIT – III</b>								
<b>Linear DataStructures – Stacks</b> Representation of Stack using sequential storage and linked allocation methods, Operations on Stacks- Push, Pop, and Display.								
<b>UNIT - IV</b>								
<b>Linear DataStructures - Queues</b> Representation of Queue using sequential and linked allocation, Operations on Queues- Insertion, Deletion and Traversing, Circular queue.								
<b>UNIT - V</b>								
<b>Non Linear Data Structures-Trees</b> Basic terminology, Binary trees, Representation of Binary tree in memory using arrays and linked lists, Binary Search Trees, Operations on binary search trees- Insertion, Deletion and Recursive Traversals- Preorder, Inorder and Postorder.								
<b>Text Books :</b>								
1. Jean Paul Tremblay and Paul G.Sorenson[2007], An Introduction to DataStructures With Applications, TMH.								
2. Debasis Samantha, Classic Data Structures Second Edition (2009), PHI.								
<b>Reference Books :</b>								
1. Pradip Dey, Manas Ghosh and Reema Tereja, Computer Programming and DataStructures, 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](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 shall be 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 Examination:**

The question paper for End examination shall be for 60 marks. The Question paper shall contain Five Units with Two Questions (Either or Type) from each unit. Each of these questions may contain sub-questions. and the student should answer any one question from each unit. Each Question carries 12 marks.



## ENVIRONMENTAL STUDIES (ES)

II Semester: ECE,CSE,CST,CE,EEE,ME, CSE(AIML) & CSE(DS)						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
MC101	MC	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	-	-	-	100	-	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

#### **Introduction to Environmental studies and Natural resources:**

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

#### **Concepts of ecosystem:**

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 grass lands, desert, pond and ocean ecosystems.

### UNIT – III

#### **Biodiversity and its conservation**

Definition and levels of biodiversity. Values of biodiversity- consumptive, productive, social, ethical, aesthetic and ecological services. Hot spots of biodiversity. Bio geographical 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

#### **Environmental pollution**

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/ ME, CE, EEE, CSE(AIML) & CSE(DS)					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
<b>End Exam Duration: 2 Hrs</b>								
<b>Course Outcomes:</b> At the end of the course students will be able to								
<b>CO1:</b> Apply the knowledge of physics laboratory in measuring the standard values.								
<b>CO2:</b> Apply theoretical knowledge to experimental values.								
<b>List of Experiments</b>								
<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.								

## STATISTICAL METHODS LAB (SM(P))

II Semester: CSE,CST,CSE(AIML) & CSE(DS)					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS112	BSL	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		0	0	3	1.5			
<b>End Exam Duration: 2 Hrs</b>								
<b>Course Outcomes :</b> At the end of the course the student will be able to								
<b>CO1:</b> Implement the basic data types and flow control statements in R Language.								
<b>CO2:</b> Implement functions, matrices and vectors.								
<b>CO3:</b> Apply different file operations and statistical methods for data analysis.								
<b>CO4:</b> Implement various visualization techniques								
<b>R statistical programming language:</b> Introduction to R, Functions, Control flow and Loops, Working with Vectors and Matrices, Reading in Data, Writing Data, Working with Data, Manipulating Data, Simulation, Linear model, Data Frame, Graphics in R.								
<b>List of Experiments</b>								
1. Introduction to R- Exploring R, R-Studio Environment and Installation process. Explore the features.								
2. Explore the control structures, loops of R and demonstrate with one example under each case.								
3. Explore Functions (pre defined and user defined) in R.								
4. Working with Vectors and Matrices in R.								
5. Importing data from various file formats for data analysis.								
6. Exporting data to various file formats.								
7. Manipulation of Data using statistical measures.								
8. Implement simple linear regression method.								
9. Create, access, modify, extract and delete Data Frame in R.								
10. Plot various graphs using graphics in R(Histogram, Bar plots).								
11. Plot various graphs using graphics in R(Pie charts, Box Plots, Scatter plots).								
<b>Text Books</b>								
1. Probability and Statistics for Engineers (Fourth Edition), I.R. Miller, J.E. Freund and R. Johnson; Prentice Hall India Learning Private Limited.								
2. Fundamentals of Statistics (vol. I & vol. II), A. Goon, M. Gupta and B. Dasgupta, World Press								
3. The Analysis of Time Series: An Introduction, Chris Chatfield, Chapman & Hall/CRC								
<b>Reference Books</b>								
1. Introduction to Linear Regression Analysis, D.C. Montgomery and E. Peck, Wiley-Inter science.								
2. Introduction to the Theory of Statistics, A.M. Mood, F. A. Graybill and D.C. Boes, McGraw Hill.								
3. Applied Regression Analysis, N. Draper and H. Smith, Wiley- Inter science.								
4. Hands-on Programming with R, Garrett Golemund, O'Reilly.								
5. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander, Addison-Wesley Professional.								

## DATA STRUCTURES LAB (DS(P))

<b>II Semester : Common for CSE, CST, ECE ,EEE, CSE(AIML) &amp; CSE(DS)</b>						<b>Scheme : 2020</b>		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS109	ESL	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Continuous Internal Assessment</b>	<b>End Exam</b>	<b>TOTAL</b>
		-	-	3	1.5	40	60	100
<b>End Exam Duration: 3 Hrs</b>								
<b>Course Outcomes :</b> At the end of the course students will be able to								
<b>CO1:</b> Implement the operations on array data structure.								
<b>CO2:</b> Implementation of searching and sorting techniques.								
<b>CO3:</b> Implement Stacks using static and dynamic allocation.								
<b>CO4:</b> Implement Queues using static and dynamic allocation.								
<b>List of Experiments</b>								
1. Array Data Structures: <ul style="list-style-type: none"> <li>a) Array Operations</li> <li>b) Merging of two sorted arrays.</li> </ul>								
2. Applications of Array Data Structures: <ul style="list-style-type: none"> <li>a) Linear Search</li> <li>b) Binary Search</li> <li>c) Bubble Sort</li> <li>d) Insertion Sort</li> <li>e) Selection Sort</li> </ul>								
3. Implementation of single linked list and its operations								
4. Implementation of double linked lists and its operations								
5. Implementation of stack operations using static allocation								
6. Implementation of stack operations using dynamic allocation								
7. Implementation of queue operations using dynamic allocation								
8. Implementation of circular queue operations using static allocation								
<b>Reference Books :</b>								
1. Yashavanth P.Kanetkar , Let US C , BPB Publications, 7 <sup>th</sup> Edition,2007.								
2. B.W. Kernignan and Dennis M.Ritchie, The C Programming Language , (PHI), 2 <sup>nd</sup> Edition 2003.								