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		
		L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
CS101	ESC	3	0	-	3	40	60	100
Sessional Exam Duration : 1 ½ 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. 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.

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**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**Total**
CS107	**ESL**	**-**	**-**	**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 , Let US C , BPB Publications, 7th Edition,2007.

2. B.W. Kernignan and Dennis M.Ritchie, The C Programming Language , (PHI), 2nd Edition 2003.

PROBABILITY & STATISTICAL METHODS (PSM)

II Semester : Common for **CSE & CST**						**Scheme : 2020**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
BS106	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 the student will be able to

CO1: Gain the knowledge on Mathematical Statistics and probability theory.

CO2: Classify discrete and continuous distributions.

CO3: Understand the test of hypothesis for large samples.

CO4: Analyze the Test of significance for small samples.

CO5: Find correlation coefficient and classification of ANOVA.

UNIT – I

Statistical Methods: Introduction to statistics, Frequency distribution, Measures of Central Tendency, Measures of dispersion, Moments.
Probability: Basic concepts of probability, Addition and Multiplication law of probability, Mathematical Expectation -Variance and Co-variance.

UNIT - II

Probability Distributions: Random variable – Discrete and continuous probability distributions and Functions; Binomial, Poisson and Normal distributions.

UNIT – III

Test of Hypothesis: 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.

UNIT - IV

Test of Significance: 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.

UNIT - V

Correlation: Co-efficient of Correlation, Lines of regression and Rank Correlation.
Analysis of Variance: ANOVA for One-way classification, ANOVA for Two-way classification.

Text Books

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, 5th Edition, 2015.
3. B.S.Grewal [2012], Higher Engineering Mathematics, Khanna Publishers, New Delhi.

Reference Books

1. K.Murugesan & P.Gurusamy , Probability And Statistics , Anuradha Publications.
2. Probability And Statistics, Murray R Spiegal and others, Schaum's series, Tata Mcgraw Hill Education.
3. Leomard 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)

I/II Semester : Common for CE, EEE, ME/ ECE, CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
HU101	HSSC	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

CO 1: Use Grammatically acceptable English in Oral and Written communication.

CO 2: Use appropriate Vocabulary in Technical and General Contexts.

CO 3: Comprehend General and Technical Content using various Reading Skills like Skimming and Scanning.

CO 4: Write Letters, Summaries and Essays of topical, Narrative, Descriptive, Analytical and Persuasive nature.

CO 5: 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 Resume Preparation

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. 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, 3rd 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, Tata McGraw-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

ENGINEERING DRAWING (ED)

I / II Semester : Common to CE, ECE,ME/ CSE,CST, EEE						Scheme : 2020		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
ME101	ESC	**1**	**-**	**4**	**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

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

Introduction to Engineering Drawing:

Drawing instruments and their uses, Lettering and Dimensioning. Introduction to polygons and conics. Introduction to scales (**not for End examinations**)

Orthographic projections:

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)

Projection of planes:

Regular planes- perpendicular, parallel to one reference plane and inclined to other reference planes - Inclined to both the reference planes

UNIT – II

Projections of solids:

Projections of right regular solids- prism, pyramid, cylinder and cone with axis inclined to one plane and inclined to both planes.

UNIT – III

Sections of Solids:

Sectional views of right regular solids - prism, pyramid, cylinder and cone. True shapes of Sections (Treatment is limited to simple problems only)

Development of Surfaces:

Development of surfaces of right regular solids and their sections - prism, pyramid, cylinder and cone.

UNIT – IV

Orthographic projections:

Conversion of pictorial views into orthographic views (Treatment limited to simple problems only)

UNIT – V

Isometric Projections:

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 th 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)

II Semester : Common for CSE,CST,ECE & EEE						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS104	ESC	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 the student will be able to

CO1: Understand the purpose of array data structure and its applications

CO2: Understand the linked list data structure and its operations.

CO3: Illustrate the operations performed on stack data structure.

CO4: Illustrate the operations performed on queue data structure

CO5: Understand the concepts of trees and operations on binary search trees.

UNIT – I

Introduction to Data Structures

Definition,Classification of Datastructures- 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, Insertion Sort, Merging of arrays.

UNIT – II

Linked Storage Representation –Linked Lists

Linked storage representation using pointers, Types of Linked Lists–Single linked list, Double linked list, Operations on linked lists-Traversing, Searching, Insertion and Deletion.

UNIT – III

Linear DataStructures – Stacks

Representation of Stack using sequential storage and linked allocation methods, Operations on Stacks- Push, Pop, and Display.

UNIT - IV

Linear DataStructures - Queues

Representation of Queue using sequential and linked allocation, Operations on Queues- Insertion, Deletion and Traversing, Circular queue.

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, Operations on binary search trees- Insertion, Deletion and Recursive Traversals- Preorder, Inorder and Postorder.

Text Books :

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.

Reference Books :

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
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.

STATISTICAL METHODS LAB (SM(P))

II Semester : CSE & CST						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	40	60	100
End Exam Duration: 2 Hrs								

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

CO1: Implement the basic data types and flow control statements in R Language.

CO2: Implement functions, matrices and vectors.

CO3: Apply different file operations and statistical methods for data analysis.

CO4: Implement various visualization techniques

R statistical programming language: 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.

List of Experiments

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).

Text Books

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

Reference Books

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 Grolemund, O′Reilly.
5. R for Everyone: Advanced Analytics and Graphics, Jared P. Lander, Addison-Wesley Professional.

PHONETICS & COMMUNICATION SKILLS LAB (PCSP)

I/II Semester : Common for CE, EEE, ME/ ECE, CSE & CST					Scheme : 2020			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
HU103	HSSL	0	0	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: 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. 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.

DATA STRUCTURES LAB (DS(P))

II Semester : Common for CSE, CST, ECE & EEE						**Scheme :** 2020		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS109	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 the operations on array data structure.

CO2: Implementation of searching and sorting techniques.

CO3: Implement Stacks using static and dynamic allocation.

CO4: Implement Queues using static and dynamic allocation.

List of Experiments

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
   c) Bubble Sort
   d) Insertion Sort
   e) Selection Sort
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

Reference Books :

1. Yashavanth P.Kanetkar , Let US C , BPB Publications, 7th Edition,2007.

2. B.W. Kernignan and Dennis M.Ritchie, The C Programming Language , (PHI), 2nd Edition 2003.

ADVANCED DATA STRUCTURES (ADS)

III Semester : Common for CSE & CST						**Scheme : 2020**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS202	**PCC**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		3	**-**	**-**	**3**	**40**	**60**	**100**
Sessional Exam Duration : 1½ Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Illustrate the applications of Linked Lists, Stacks and Queues.

CO2: Comprehend the operations performed on Binary Search Tree and AVL Tree.

CO3: Understand Heap Operations and Applications.

CO4: Organize the data using Hashing Techniques for efficient Searching.

CO5: Understand Operations on Special Trees and String searching algorithms.

UNIT – I

Linear Data Structures-Applications:
Applications of Linked lists- Polynomial manipulation.
Applications of Stacks- Recursion, Quick sort, Polish notations, Conversion of infix notation to postfix notation, Postfix expression evaluation.
Applications of Queues- Breadth First Search.

UNIT – II

Non Linear Data Structures:
Operations on Binary Search Trees- Insertion, Deletion and Traversals.
AVL Trees and their operations, Threaded Binary Trees.

UNIT – III

Priority Queues (Heaps):
Simple Priority Queues - Using arrays and linked lists , Binary Heaps- Max heap, Min heap,
Applications of Binary heap- Heap Sort.
d-heaps, Leftist Heaps, Skew Heaps and Binomial Queues.

UNIT – IV

Hashing Techniques:
Hashing Definition, Hash functions, Open Hashing (Separate Chaining), Closed Hashing (Open Addressing) - Linear Probing, Quadratic Probing, Double Hashing.
Rehashing and Extendible Hashing.

UNIT – V

Special Trees:
Splay Trees, B-Trees and their operations.
String Searching Algorithms:
Brute-Force algorithm, Boyer-Moore algorithm and RabinKarp algorithm

Text Books:

1. An introduction to Data Structures with Applications, Jean Paul Tremblay and Paul G.Sorensen, McGraw Hill Education, Second Edition, 2017
2. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Pearson, Second Edition 2005

Reference Books:

1. Algorithms in C, Robert Sedgewick, Addison-Wesley Publishing Company, 2016.
2. Classic Data Structures- Debasis Samanta, PHI Publications, Second Edition, 2009.
3. Data Structures and Algorithms, GAV Pai, Tata McGraw Hill Publications, 2008

Question Paper Pattern:

Sessional Examination:

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 consists of 3 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 is for 60 marks. The Question paper shall consists of 5 units with Two Questions (EITHER/OR type) in each unit. Each of these questions may contain sub questions and the student shall answer one question from each unit. Each question carries 12 marks.

DATABASE SYSTEMS (DBS)

<table>
<tr><td colspan="5">III Semester : Common for CSE & CST</td><td colspan="4">Scheme : 2020</td></tr>
<tr><td rowspan="2">Course Code</td><td rowspan="2">Category</td><td colspan="3">Hours/Week</td><td>Credits</td><td colspan="3">Maximum Marks</td></tr>
<tr><td rowspan="2">CS203</td><td rowspan="2">PCC</td><td>L</td><td>T</td><td>P</td><td>C</td><td>Continuous Internal Assessment</td><td>End Exam</td><td>TOTAL</td></tr>
<tr><td>3</td><td>-</td><td>-</td><td>3</td><td>40</td><td>60</td><td>100</td></tr>
<tr><td colspan="5">Sessional Exam Duration : 1½ Hrs</td><td colspan="4">End Exam Duration: 3 Hrs</td></tr>
<tr><td colspan="9">Course Outcomes : At the end of the course the student will be able to</td></tr>
<tr><td colspan="9">CO1: Understand the concepts of Database Management Systems and Entity Relationship Modeling.</td></tr>
<tr><td colspan="9">CO2: Use SQL commands to create, retrieve, update, and delete data from the Data bases.</td></tr>
<tr><td colspan="9">CO3: Comprehend the concepts of Normalization techniques and Indexing.</td></tr>
<tr><td colspan="9">CO4: Understand the properties of Transactions in a Database System.</td></tr>
<tr><td colspan="9">CO5: Understand Concurrency Control techniques and Recovery System.</td></tr>
<tr><td colspan="9">UNIT – I</td></tr>
<tr><td colspan="9">Introduction: Introduction to DBMS, Purpose of Database Systems, Database System Applications, View of Data, Data Models, Database Users, Database Architecture.
Entity-Relationship Model: Basic Concepts, Cardinality of Relationship, ER Diagram Notations, Entity-Relationship Diagrams, Extended E-R Features, Modeling using ER Diagrams, Reduction of an E-R Schema to Tables.</td></tr>
<tr><td colspan="9">UNIT – II</td></tr>
<tr><td colspan="9">Relational Query Languages: Relational Algebra, SQL, Data Definition Language Commands, Data Manipulation Language Commands and Data Control Language Commands, Candidate Key, Primary key, Foreign key, Select Clause, Where Clause, Logical Connectivity’s – AND, OR, Range Search, Pattern Matching, Order By, Group By, Set Operations – Union, Intersect and Minus, Aggregate Functions, Join Operations.
PL/SQL: Control Structures, Procedures, Functions, Triggers and Cursors.</td></tr>
<tr><td colspan="9">UNIT – III</td></tr>
<tr><td colspan="9">Relational Database Design: Features of Good Relational Database Designs, Decomposition, Normalization, Functional Dependency, Types of Normal Forms - First Normal Form, Second Normal Form, Third Normal Form, Boyce Codd Normal Form (BCNF), Fourth Normal Form and Fifth Normal Form.
Indexing and Hashing: Basic Concepts, Ordered Indices, Multilevel Indices, Secondary Indices, Static Hashing and Dynamic Hashing.</td></tr>
<tr><td colspan="9">UNIT – IV</td></tr>
<tr><td colspan="9">Transactions: ACID properties, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions.
Serializability: Conflict Serializability, View Serializability, Recoverability – Recoverable and Non-Recoverable Schedules, Cascade less Schedules, Testing for Serializability.</td></tr>
</table>

UNIT – V

Concurrency Control: Lock-Based Protocols – Locks, Granting of Locks, The Two-Phase Locking Protocol, Timestamp-Based Protocols – Timestamps, The Timestamp-Ordering Protocol, Thomas Write Rule, Deadlock handling – Deadlock Prevention, Deadlock Detection and Recovery.
Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging Technique.

Text Books:

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth and S. Sudarshan, McGraw Hill, 7th Edition, 2019.
2. SQL, PL/SQL, Ivan Bayross, 4th Edition, 2020.

Reference Books:

1. Principles of Database and Knowledge – Base Systems, J. D. Ullman, Vol. 1, 2016.
2. Fundamentals of Database Systems. R. Elmasri and S. Navathe, 7th Edition, 2017.
3. Data Base Management Systems, Raghu Ramakrishna and Johnannes Gehrke, McGraw Hill, 3rd Edition, 2014.

Question Paper Pattern:

Sessional Examination :

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 question and the student should answer any one question from each unit. Each Question carries 12 marks.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA (OOPJ)

III Semester : Common for CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS204	PCC	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	-	-	3	40	60	100
Sessional Exam Duration : 1½ Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand Object Oriented Programming concepts.

CO2: Demonstrate the concepts of Inheritance, Packages and Interfaces.

CO3: Understand String handling methods and Exception handling mechanism.

CO4: Comprehend Multithreading and Java Data Base Connectivity.

CO5: Understand Collection interfaces and Collection classes.

UNIT – I

Object Oriented concepts:
Overview of Java, Java buzzwords, Data types, Arrays, Operators, Control Statements.
Introduction to Classes-Classes and Objects, Methods, Constructors, Reading Console input, Writing Console output, this keyword, Garbage collection, finalize and Wrapper classes.

UNIT – II

Inheritance:
Inheritance basics, super key word, Method overloading, Dynamic method dispatch, Abstract classes and final key word.

Packages:
Defining a package, Access protection, Importing packages.

Interfaces:
Defining an interface and Implementing interfaces.

UNIT – III

String Handling:
String constructors, String methods-Character extraction, String comparison, Searching strings and Modifying strings. StringBuffer class and its methods. StringBuilder class and its methods.

Exception Handling:
Introduction, Types of Exceptions, try, catch, throw, throws and finally. Java built-in exceptions, Creating customized exceptions.

UNIT – IV

Multithreading:
Java thread model, Creating a thread- Extending Thread class and Implementing Runnable interface, Thread class methods, Thread priorities, Synchronization and Inter Thread Communication.

JDBC:
JDBC Drivers, Driver Manager, Connection, Statement, Result Set and Prepared Statement.

UNIT – V

Collections Framework:
Collection Interfaces- List, Set,SortedSet, Queue, Deque.
Collection Classes-ArrayList, Linked List, HashSet, Linked HashSet, Tree Set, Priority Queue and Array Deque.
Accessing a Collection using an Iterator, The For-Each Alternative to Iterators

Text Books:

1. Java The Complete Reference, Herbert Schildt, TATA McGraw-Hill, Eleventh Edition, 2019.
2. Programming with Java, E Balaguruswamy, A Primer, TATA McGraw-Hill, Sixth Edition, 2019.

Reference Books:

1. Thinking in Java, Bruce Eckel, Pearson Education, Fourth Edition, 2008.
2. Java How to Program, Early Objects, H.Deitel and P.Deitel, Global Edition, 2017

Question Paper Pattern:

Sessional Examination :

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 question and the student should answer any one question from each unit. Each Question carries 12 marks.

ADVANCED DATA STRUCTURES LAB (ADS(P))

III Semester : Common for CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS205	PCL	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		-	-	3	1.5	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

CO1: Implement the applications of Linked lists, Stacks and Queues.

CO2: Implement Binary Search Tree and AVL Tree operations.

CO3: Implement Hashing Techniques.

CO4: Implement String searching algorithms.

List of Experiments

1. Application of Linked List : Addition of two polynomial equations.
2. Conversion of Infix expression to Postfix expression
3. Evaluation of Postfix Expression
4. Quick Sort (Recursion).
5. Application of Queue: Breadth First Search Graph traversal technique.
6. Insertion, Deletion and Traversal operations on a Binary Search Tree.
7. Insertion and Traversal operations on an AVL Tree.
8. Application of Binary Heap: Heap Sort.
9. Implementation of Hashing Techniques - Linear Probing, Quadratic Probing and Separate Chaining method.
10. Implementation of Brute force String searching technique.

DATABASE SYSTEMS LAB (DBS (P))

III Semester : Common for CSE & CST						**Scheme : 2020**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
CS206	**PCL**	**-**	**-**	**3**	**1.5**	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Design Entity Relationship diagrams and Schema diagrams for real life systems.

CO2: Implement SQL queries on the real-life systems.

CO3: Write PL/SQL programs for given problems.

CO4: Implement Procedures, Functions, Triggers and Cursors in PL/SQL.

List of Experiments

1. Perform DDL, DML and DCL commands.
2. Design and create a University Library Database using ER diagram and Schema diagram.
3. Design and create a University database consisting of the following tables Department, Course, Instructor and Student using ER Modeling and Schema Diagram.
4. Create various tables like Branch, Account, Depositor, Customer, Loan and Borrower for a Banking system with constraints using a Schema diagram.
5. Perform various SQL queries on Select clause, Where clause, Pattern matching, Order by, and Group by.
6. SQL Queries on Set operations, Aggregate functions and Join operations.
7. PL/SQL program using Control Structures.
8. Program to implement Procedures and Functions.
9. Program to implement Cursors.
10. Program to implement Triggers.

OBJECT ORIENTED PROGRAMING THROUGH JAVA LAB (OOPJ(P))

III Semester : Common for CSE & CST						**Scheme : 2020**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS207	**PCL**	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		-	**-**	**3**	**1.5**	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Implement Method overloading and Constructor overloading.

CO2: Implement Inheritance, Packages and Interfaces concepts.

CO3: Implement String handling and Exception handling.

CO4: Implement multithreading and collections.

List of Experiments

1. Programs on Method overloading and Constructor overloading.
2. Program to implement Multilevel and Hierarchical Inheritance.
3. Program to implement Packages with access protection.
4. Program to implement Multiple inheritance using interfaces.
5. Programs on String Handling methods.
6. Programs to implement built-in exceptions and customized exceptions.
7. Programs to implement Synchronization and Inter Thread Communication in Multi-threading.
8. Programs to implement ArrayList, LinkedList and HashSet collections.

SOFT SKILLS LAB (SS(P))

III/IV Semester : Common for all Branches						**Scheme : 2020**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
SCCM01	SC	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		-	**-**	**4**	**2**	**40**	**60**	**100**

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

CO1: Communicate effectively and enhance their interpersonal relationship building skills with renewed self confidence

CO2: Work together in teams and accomplish objectives in a cordial atmosphere

CO3: Face interviews, GDs and give presentations

CO4: Understand and develop the etiquette necessary to present themselves in a professional setting

CO5: Learn the Principles of Personal effectiveness

List of Activities

1. Ice breaking Activities, Principles of Time and Stress Management
2. Art of speaking
3. Art of writing - Essay / Picture / Story
4. Business etiquette - Telephone and email
5. Presentation Skills - Power point making
6. Group Discussion – Objectives and Skills tested in a GD, types of GD, Dos and don'ts & practice
7. Team work - Drama / Skit / Role play
8. Paper / Poster Presentation
9. Problem Solving by lateral thinking puzzles
10. Know your General Awareness / Knowledge – Quiz
11. Principles of Personal excellence
12. Interview Skills

Reference Books :

1. Stephen R. Covey, “The Seven Habits of Highly Effective People”, Pocket Books Publishers, London
2. Priyadarshani Patnaik, “Group Discussion and Interview Skills with VCD”, Foundation Books.
3. Sangeeta Sharma &Binod Mishra, “Communication Skills for Engineers and Scientists”, PHI Learning Private Limited.
4. Shiv Khera, “You Can Win”, MacMillan India Publishers, New Delhi
5. Campus Connect Portals - TCS - https://campuscommune.tcs.com; Infosys http://campusconnect.infosys.com/

SOFTWARE ENGINEERING & APPLICATIONS (SEA)

IV Semester : Common for CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS209	PCC	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		2	1	-	3	40	60	100
Sessional Exam Duration : 1½ Hrs						End Exam Duration: 3 Hrs		

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

CO1: Identify the key activities in managing a software project and Process Models.

CO2: Understand the components of Software Requirements Specification document.

CO3: Apply systematic procedure for software design and deployment.

CO4: Understand the testing strategies to build the test cases.

CO5: Estimate project risks and project metrics.

UNIT – I

Software Process and Agile Development: Introduction to Software Engineering, Evolving Role of Software, Software Crisis, Software Process, Process Models: Waterfall Model, Incremental Process Model, Spiral Model, Perspective and Specialized Process Models –Introduction to Agility-Agile process-Extreme programming-XP Process.

UNIT – II

Requirements Analysis & Specification: Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management.

UNIT – III

Software Design: Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design - Architectural styles, Architectural Patterns, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components.

UNIT – IV

Testing & Maintenance: Software testing fundamentals-Internal and external views of Testing-white box testing - basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing Art of Debugging –Software Implementation Techniques: Coding practices-Refactoring-Maintenance

UNIT – V

Risk Management & Software Metrics: Risk Management – Identification, Projection - Risk Management - Risk Identification-RMMM Plan-CASE TOOLS. Metrics for Process & Products.Software Measurement, Metrics for software quality, Types of Metrics-Function Point, Size

Oriented Metrics.

Text Books:

1. Roger S. Pressman, -Software Engineering – A Practitioner"s Approach|, Seventh Edition, Mc Graw-Hill International Edition, 2010.
2. Ian Sommerville, -Software Engineering|, 9th Edition, Pearson Education Asia, 2011.

Reference Books:

1. K.K.Agarwal&Yogesh Singh [2008], *Software Engineering*, New Age International Publishers.
2. James F.Peters,Witoldpedecz,JohnWiely [2008], *Software Engineering-an Engineering approach*
3. Pankaj Jalote's , Software Engineering -A Precise Approach, Wiley

Question Paper Pattern:

Sessional Examination :

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 question and the student should answer any one question from each unit. Each Question carries 12 marks.

PYTHON PROGRAMMING (PYP)

IV Semester : Common for CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
SCCS01	SC	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		1	-	2	2	40	60	100
Sessional Exam Duration : 1½ Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the python programming constructs, operators and expressions.

CO2: Apply the concepts of functions, decision and control structures to solve problems.

CO3: Apply the core data structures String, List, Tuple, Set and Dictionaries to solve problems.

CO4: Understand file operations, exception handling and modules.

CO5: Apply Object Oriented Programming concepts to solve real life problems.

UNIT – I

Introduction to Python Programming: Overview of Programming Languages, History of Python, Installing Python, Executing Python Programs, Commenting in Python, Internal Working of Python.

Basics of Python Programming: Python Character Set, Token, Python Core Data Type, I/O functions, Assigning Value to a Variable, Multiple Assignments, Writing Simple Programs in Python, Formatting Number and Strings, Python Inbuilt Functions.

Operators and Expressions: Operators and Expressions, Arithmetic Operators, Operator Precedence and Associativity, Changing Precedence and Associativity of Arithmetic Operators, Translating Mathematical Formulae into Equivalent Python Expressions, Bitwise Operator, The Compound Assignment Operator.

UNIT – II

Decision Statements: Boolean Type, Boolean Operators, Using Numbers with Boolean Operators, Using String with Boolean Operators, Boolean Expressions and Relational Operators, Decision Making Statements, Conditional Expressions.

Loop Control Statements: The while Loop, The range() Function, The for Loop, Nested Loops, The break Statement, The continue Statement.

Functions: Syntax and Basics of a Function, Use of a Function, Parameters and Arguments in a Function, The Local and Global Scope of a Variable, The return Statement, Recursive Functions, The Lambda Function.

UNIT – III

Strings: The str class, Basic Inbuilt Python Functions for String, The index[] Operator, Traversing String with for and while Loop, Immutable Strings, The String Operators, String Operations.

Lists: Creating Lists, Accessing the Elements of a List, Negative List Indices, List Slicing [Start: end], List Slicing with Step Size, Python Inbuilt Functions for Lists, The List Operator, List Comprehensions, List Methods, List and Strings, Splitting a String in List, Passing List to a Function, Returning List from a Function.

Tuples, Sets and Dictionaries: Introduction to Tuples, Sets, Dictionaries.

UNIT – IV

Exceptions: When Something Goes Wrong, Classes of Exceptions, A Final Note on Pythonic Exception Handling.
File Handling: Need of File Handling, Text Input and Output, The seek() Function, Binary Files, Accessing and Manipulating Files and Directories on a Disk.
Modules: Reusing Code with Modules and Packages, Understanding Python Modules, Everyday Module Usage, Advanced Module Behavior, Combining Modules into Packages

UNIT – V

Object-Oriented Programming: Class, Objects and Inheritance: Defining Classes, The Self-parameter and Adding Methods to a Class, Display Class Attributes and Methods, Special Class Attributes, Accessibility, The __init__ Method (Constructor), Passing an Object as Parameter to a Method, __del__() (Destructor Method), Class Membership Tests, Method Overloading, Operator Overloading, Inheritance, The Object Class.

Text Books:

1. Programming and problem solving with Python by Ashok Namdev Kamthane, Amit Ashok Kamthane (2018): McGraw Hill Education (India) Private Limited.
2. Python 3 for Absolute Beginners, Tim Hall and J-P Stacey, Apress.

Reference Books:

1. Python -The Ultimate Beginner's Guide! , Andrew Johansen.

Web References:

1. https://www.tutorialspoint.com/python3/
2. https://docs.python.org/
3. https://realpython.com/

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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 question and the student should answer any one question from each unit. Each Question carries 12 marks.

Laboratory:
1. Implement operations on numbers.
2. Implement decision making and looping statements.
3. Demonstrate the concept of functions.
4. Demonstrate the working of core data structures.
5. Demonstrate the creation and importing of modules.
6. Implement exception handling concepts.
7. Implement file operations.
8. Demonstrate Object-Oriented Programming concepts.

SOFTWARE ENGINEERING & APPLICATIONS LAB (SEA(P))

IV Semester : Common for CSE & CST						Scheme : 2020		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS214	PCL	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		-	-	3	1.5	40	60	100
Sessional Exam Duration: 2Hrs						End Exam Duration: 3 Hrs		

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

CO1: Identify suitable software development process model for a given scenario

CO2: Create a UML diagrams for a specified problem

CO3: Apply testing methodologies for validating design models

List of Experiments

1. **Role of Software & Software Development Model:** Identify the role of the software in today's world & suitable software development model for the given scenario.
2. **Requirement Development:** Identify the various requirement development activities viz. elicitation, analysis, specification and verification for the given scenario, develop an SRS document.
3. **Introduction to UML:** To create a UML diagram of ATM APPLICATION
4. To create a UML diagram of LIBRARY MANAGEMENT SYSTEM
5. To create a UML diagram of BANKING SYSTEM
6. To create a UML diagram of RAILWAY RESERVATION SYSTEM
7. **Software Testing:** Design the Test cases for triangle problem with Software Testing Technique: Boundary Value Analysis using C
8. Win Runner is a program that is responsible for the automated testing of software. Win Runner is a Mercury Interactive enterprise functional testing tool for Microsoft windows applications.(Calculator App)
9. Study of any web testing tool (e.g. Selenium) with a given scenario
10. To create GIT account for Testing to Version Control

ADVANCED DATA STRUCTURES (ADS)

III Semester: CSE						**Scheme:** 2017		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
CS203	Professional Core	3	0	0	3	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration:** 3 Hrs		

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

CO1: Understand the concept of Class, Object and Dynamic Memory allocation in C++.

CO2: Illustrate the applications of Linked Lists, Stacks and Queues.

CO3: Comprehend the operations performed on Binary Search Trees and AVL Trees.

CO4: Understand the Operations and Applications of Heaps.

CO5: Organize the data using various Hashing Techniques for efficient Searching.

UNIT– I

Introduction to C++

Structure of a C++ program, Class, Object, Scope Resolution operator, Defining Member functions, Constructors, Dynamic Memory allocation.

UNIT– II

Review of Elementary Data Structures: Arrays, Linked Lists, Stacks, Queues

Applications of Linked lists: Polynomial manipulation.

Applications of Stacks: Recursion, Quick sort, Polish notations, Conversion of infix notation to postfix notation, Postfix expression evaluation.

Applications of Queues: Breadth First Search.

UNIT– III

Non Linear Data Structures:

Operations on Binary Search Trees, AVL Trees and their operations, Threaded Binary Trees.

Special Trees: Splay Trees, B-Trees and their operations.

UNIT– IV

Priority Queues (Heaps):

Simple Priority Queues- Implementation using arrays and linked lists, Binary Heaps.

Applications of Binary heap- Heap Sort; d-heaps, Leftist Heaps, Skew Heaps, Binomial Queues

UNIT– V

Hashing Techniques:

Hashing Definition, Hash functions, Open Hashing (Separate Chaining), Closed Hashing (Open Addressing)- Linear Probing, Quadratic Probing, Double Hashing; Rehashing, Extendible Hashing.

String Searching Techniques:

History, Brute-Force algorithm, Knuth-Morris-Pratt algorithm, Boyer-Moore algorithm, Robin-Karp algorithm.

Text Books :

1. Herbert Scheldt, [4th Edition], The Complete reference C++, Tata McGraw-Hill
2. Jean Paul Tremblay and Paul G.Sorensen [2007], An introduction to Data Structures with Applications, TMH.
3. Robert Sedgewick, Algorithms in C, Addison-Wesley Publishing Company.

Reference Books :

1. E.Balaguruswamy [2008], Object Oriented Programming with C++
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C [Second Edition].
3. GAV Pai, Data Structures and Algorithms, Tata McGraw Hill Publications.

Web References:

1. https://www.cprogramming.com/algorithms-and-data-structures.html
2. https://www.tutorialspoint.com/data_structures_algorithms
3. http://index-of.co.uk/Algorithms/Algorithms%20in%20C.pdf

Question Paper Pattern:

Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

DATABASE MANAGEMENT SYSTEMS (DBMS)

III Semester: CSE						**Scheme: 2017**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS205	Professional Core	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		3	**0**	**-**	**3**	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Design ER model for a practical Real life system.

CO2: Use SQL commands to create, update, modify and retrieve data from the data bases.

CO3: Understand the importance of Good database design and indexing.

CO4: Understand the properties of transactions in a database system.

CO5: Understand Concurrency control techniques and Recovery system.

UNIT– I

Introduction: Introduction to DBMS, Purpose of Database Systems, Database System Applications, View of Data, Data Models, Database Users, Database Architecture.

Entity-Relationship Model: Basic Concepts, Cardinality of Relationship, ER Diagram Notations, Entity-Relationship Diagrams, Extended E-R Features, Modeling using ER Diagrams, Reduction of an E-R Schema to Tables.

UNIT– II

Structured Query Language (SQL): Introduction to SQL, Data types, Data Definition language commands, Data Manipulation language Commands and Data control Language Commands , Candidate Key, Primary key, Foreign key, Select Clause, Where Clause, Logical Connectivity's – AND, OR, Range Search, Pattern Matching, Order By, Group By, Set Operations – Union, Intersect and Minus, Aggregate Functions, Join Operations.

PL/SQL: Control Structures, Procedures, functions, Triggers and Cursors.

UNIT– III

Relational Database Design: Features of Good Relational database Designs, Decomposition, Normalization, Functional Dependency, Types of Normal Forms - First Normal Form, Second Normal Form, Third Normal Form, Boyce Codd Normal Form(BCNF), Fourth Normal Form and Fifth Normal Form.

Indexing and Hashing: Basic Concepts, Ordered Indices, Multilevel Indices, Secondary Indices, Static Hashing and Dynamic Hashing.

UNIT– IV

Transactions: ACID properties of a Transaction, Transaction States, Implementation of Atomicity and Durability, Concurrent Executions.

Serializability : Conflict Serializability, View Serializability, Recoverability –Recoverable and Non Recoverable Schedules, Cascade less Schedules, Testing for Serializability.

UNIT– V

Concurrency control: Lock-Based Protocols, Timestamp-Based Protocols, Validation Based Protocols, Multiple Granularity, Deadlock handling.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity- Shadow Paging Technique, Log-Based Recovery.

Text Books :

1. Henry F. Korth& Abraham Silberschatz [2005], [5 Edition], Data Base System Concepts, MC Graw Hill.

Reference Books :

1. C J Date [2008], An Introduction to Data Base Systems, Pearson Education.
2. Raghu Ramakrishna and Johnannes Gehrke [2003], [3rd Edition], Data Base Management Systems, TATA Mc GrawHill.
3. ElmarsiRamez and Navrate Shamkant B [2009], Fundamentals of Data Base Systems, Pearson Education.

Web References:

1. https://www.w3schools.com/sql
2. https://www.tutorialspoint.com/plsql/index.htm

Question Paper Pattern:

Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

COMPUTER ORGANIZATION & ARCHITECTURE (COA)

III Semester: CSE						**Scheme: 2017**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS207	Professional Core	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		3	**0**	**-**	**3**	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Analyze the Computer Organization and Design of a Basic Computer.

CO2: Impart the knowledge of Programming the Basic Computer and the design of Micro programmed control unit

CO3: Understand the Internal working of an CPU, Pipeling and Vector Processing

CO4: Implement the Computer Arithmetic and understand Input Output Organization

CO5: To understand the concepts RAM, ROM, Virtual Memory and Secondary Storages

UNIT– I

Basic Computer Organization and Design

Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input/output and Interrupt, Complete Computer Description, Design of Basic Computer.

UNIT– II

Programming The Basic Computer

Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations.

Micro Programmed Control:

Control Memory, Address Sequencing, Micro program Example, Design of Control Unit.

UNIT– III

Central Processing Unit

Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC and CISC.

Pipeline and Vector Processing

Parallel Processing, Pipelining, Arithmetic and Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

UNIT– IV

Computer Arithmetic:

Introduction, Addition and Subtraction, Multiplication, Division algorithms.

Input/output Organization

Peripheral Devices, Input/output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA.

UNIT– V

The Memory System:

Basic Concepts, Semiconductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache Memories -Mapping Functions, Virtual Memories, Secondary Storage.

Text Books :

1. M. Morris Mano [2011], [3rd Edition], Computer system architecture, Pearson Education, 2011
2. Carl Hamacher, ZvonkoVranesie, SafwatZaky, [5th Edition], Computer Organization, McGraw-

Reference Books :

1. Hayes John .P, Computer architecture & organization, MGH, 1998
2. Willam Stallings, [6 th Edition], Computer Organization and Architecture Designing for performance, Pearson [PHI], 2003

Question Paper Pattern:

Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

CONSTITUTION OF INDIA (CI)

III Semester : CSE						Scheme : 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ML201	Mandatory	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		2	-	-	-	-	-	-
Sessional Exam Duration : 2 Hrs								

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

CO1: Understand the formation and principles of Indian Constitution.

CO2: Understand structure and functions of Union government and State executive. Duties of President, Vice president, Prime Minister, Governor, Chief Minister cabinet and State Legislature.

CO3: Understand constitutional amendments of 42, 44,74,76,86 and 91. Central-State relations, President rule.

CO4: Understand Indian social structure and languages in India. Rights of women, SC, ST and then weaker section.

CO5: Understand the structure of Judiciary, Role and functions of Supreme Court, High court and Subordinate courts, Judicial review.

UNIT - I

Historical back ground, Significance of Constitution, Making of the constitution, Role of the constituent Assembly, Salient features, the Preamble, Citizenship, procedure for amendment of Constitution Fundamental rights-Derivative principles of state policy-Elections in India.

UNIT - II

Union Executive: Structures of Union Government & Functions, President, Vice President, Prime Minister, Cabinet, Parliament- State Executive:Structures and Functions, Governor, Chief Minister, Cabinet, State Legislature

UNIT - III

Central, State Relations, President's Rule, Constitutional Amendments [42, 44, 74, 76, 86 & 91]-Constitutional functionaries, Working of Parliamentary system in India

UNIT - IV

Indian Social Structure, Languages in India-Political Parties & Pressure groups, Rights of Women-S.C"s, S.T"s & other weaker sections.

UNIT - V

Judiciary: Structure, Organisation of Judiciary, independence of the Judiciary, role and functions of Supreme Court, High Courts & Sub ordinate courts, Judicial Review.

Text Books :

1. Durga Das Basu, *"Introduction to the Constitution of India"*, Wedwe& Company
2. Macivel, Page, "An Introduction Analysis", Society
3. M.V. Pylee, *"Indian Constitution"*, S. Chand Publications
4. Subhash C Kashyao : *"Our Constitution"*,NationalBank,Trust, India.
5. Constitutional Law of india by Dr.S.M.Rajan

Reference Books :

1. The Constitution of India.By the Ministry of Law and Justice, The Govt. of India.
2. Constitutional Law of India by kashyapsubhasah ,c
3. Indian constitution Law by M.P.Jain
4. Constitutional Law of India by H.M Seervai

Web References:

1. https://www.india.gov.in/my-government/constitution-india

ADVANCED DATA STRUCTURES LAB (ADS (P))

III Semester: CSE					**Scheme: 2017**		
Course Code	**Hours/Week**			**Credits**	**Maximum Marks**		
CS204	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
	0	0	2	1	**50**	**50**	**100**

Sessional Exam Duration: 2 Hrs **End Exam Duration: 3 Hrs**

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

CO1: Write programs using Class and Object concepts.

CO2: Implement Programs for the applications of Linked lists, Stacks and Queues.

CO3: Perform operations on Binary Search Trees and AVL Trees.

CO4: Develop programs for various Hashing Techniques.

List of Experiments

1. Implementation of Class, Object concepts
2. Application of Linked List: Polynomial operations
3. Applications of Stacks: Conversion of arithmetic expressions from one form to other, Evaluation of Expressions, Recursion
4. Application of Queue: Graph traversals
5. Implementation of Binary Search Tree
6. Implementation of AVL Trees
7. Applications of Binary Heaps
8. Implementation of Hashing Techniques

Reference Books:

1. Herbert Scheldt, [4th Edition], The Complete reference C++, Tata McGraw-Hill.
2. Jean Paul Tremblay and Paul G.Sorensen [2007], An introduction to Data Structures with Applications, TMH.

DATABASE MANAGEMENT SYSTEMS LAB (DBMS (P))

III Semester: CSE					**Scheme: 2017**		
Course Code	**Hours/Week**			**Credits**	**Maximum Marks**		
CS206	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
	0	**0**	**2**	**1**	**50**	**50**	**100**

End Exam Duration: 3 Hrs

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

CO1: Work with the concepts of DDL, DML, DCL Commands.

CO2: Design of databases for real life systems using Oracle.

CO3: Learning of SQL queries on the real life systems.

CO4: Execution of PL/SQL programs for different problems

CO5: Implementation of procedure, function, trigger and cursor concepts in PL/SQL

List of Experiments

1. Perform DDL, DML and DCL commands.
2. Design and create a University Library Data base using ER diagram and Schema Diagram.
3. Design and create a university database consisting of the following tables Department, Course, Instructor and Student using ER Modelling and Schema Diagram.
4. Create various tables like Branch, Account, Depositor, Customer, Loan and Borrower for a banking system with constraints using a Schema diagram.
5. Perform various SQL queries on select clause, where clause, pattern matching, Order by, and Group by.
6. SQL Queries on Set operations, Aggregate functions and Join Operations.
7. PL/SQL program using control Structures
8. Program to implement Procedures and Functions.
9. Program to implement Cursors.
10. Program to implement Triggers.

Web References :

1. https://www.w3schools.com/sql
2. https://www.tutorialspoint.com/plsql/index.htm

ADVANCED COMMUNICATION SKILLS LAB (ACS(P))

III/IV Semester: Common for all Branches				**Scheme : 2017**		
Course Code	**Hours/Week**			**Credits**	**Maximum Marks**	
HU203	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**TOTAL**
	0	**0**	**2**	**1**	**100**	**100**

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

CO1: Speak in English confidently, fluently and effectively.

CO2: Exhibit team playing and leadership skills.

CO3: Give Presentations effectively.

CO4: Comprehend the Verbal and Non-verbal texts.

CO5: Prepare Resume, Company profiles and Project presentations.

CO6: Enhance possibilities of Job prospects.

List of Activities

Focus in the lab is more on fluency than on accuracy

1. Ice breaking Activities
2. JAM
3. Listening Comprehension – Practice tests
4. Oral Presentation
5. Presentation Strategies
6. Group Discussion – Team Playing, Leadership Skills
7. Debate
8. Information Transfer – Verbal to Non-verbal and Vice-Versa
9. Resume Preparation
10. Company Profiling
11. Interview Skills – a) Telephonic Interview
    b) Personal Interview
12. Project Presentation

Reference Books :

1. Communication Skills, Sanjay Kumar and PushpLata, Oxford University Press.
2. English Language Laboratories A Comprehensive Manual, NiraKonar, PHI.
3. Technical Communication 3 E, Raman and Sharma, Oxford University Press.
4. Personality Development and Soft Skills, Barun k. Mitra, Oxford University Press.

PROBABILITY AND STATISTICS (PS)

IV Semester : CSE						Scheme : 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
BS204	Foundation	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	-	-	3	40	60	100
Sessional Exam Duration : 2 Hrs						End Exam Duration: 3 Hrs		

Course Outcomes : At the end of the course the student will be able to
CO1: Gain the knowledge on Mathematical Statistics and probability theory
CO2: Classify discrete and continuous distributions
CO3: Understand the test of hypothesis for large samples
CO4: Analyze the Test of significance for small samples
CO5: Find correlation coefficient and classification of ANOVA
UNIT – I
Statistical Methods: Introduction to statistics, Frequency distribution, Measures of Central Tendency, Measures of dispersion, Moments.
Probability: Basic concepts of probability, Addition and Multiplication law of probability, Mathematical Expectation -Variance and Co-variance.
UNIT - II
Probability Distributions: Random variable – Discrete and continuous probability distributions and Functions; Binomial, Poisson and Normal distributions.
UNIT – III
Test of Hypothesis: 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.
UNIT - IV
Test of Significance: 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.
UNIT - V
Correlation: Co-efficient of Correlation, Lines of regression and Rank Correlation.
Analysis of Variance : ANOVA for One-way classification , ANOVA for Two-way classification
Text Books
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, 5th Edition, 2015.
3. B.S.Grewal [2012], Higher Engineering Mathematics, Khanna Publishers,NewDelhi.

Reference Books

1. K.Murugesan & P.Gurusamy , Probability And Statistics , Anuradha Publications
2. Probability And Statistics , Murray R Spiegal and others , Schaum's series, Tata Mcgraw Hill Education.
3. Leomard Kazmier , Business Statistics , Schaum's series, Tata Mcgraw Hill Education

Question Paper Pattern:

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End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

OBJECT ORIENTED PROGRAMMING (OOP)

IV Semester: CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS208	Professional Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	-	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand fundamentals of oop concepts, class, input and output

CO2: Explain Inheritance, packages and interface

CO3: Illustrate string handling methods, exception handling

CO4: Apply multi threading concepts, files

CO5: Understand applet programming, AWT and event handling

UNIT– I

Object oriented concepts:

Fundamentals, Overview of Java, Java buzzwords, Data types, variables and arrays. Operators, control statements. Introducing Classes: Class fundamentals, declaring objects, introducing methods, Constructors, Reading console input, writing console output, this keyword, garbage collection, finalize.

UNIT– II

Inheritance:

Inheritance basics, using super, method overriding, dynamic method dispatch, abstract class, using final with inheritance.

Packages and Interfaces:

Defining package, access protection, importing packages. Interfaces: Defining interface, implementing interface

UNIT– III

String Handling:

String constructors, Special string operations, character extraction, string comparison, searching strings, modifying strings. StringBuffer class and its methods.

Exception Handling:

Fundamentals, exception types, try, catch, throw, throws, finally. Java built-in exceptions, creating your own exception subclasses.

UNIT– IV

Multithreading:

Java thread model, Main thread, creating a thread, creating multiple threads, Thread class and its methods, isAlive( ), join( ), thread priorities, synchronization, interthread communication.

Files:

Reading and writing files

UNIT– V

Applet:

Applet basics and Applet class.

AWT Controls: Label, Button, Checkbox, Checkbox Group, Choice, List, Scrollbar, TextField, TextArea.

Event Handling: Delegation event model, Event Classes, sources of events, event listener interfaces. Adapter classes.

Text Books :

1. Herbert Schildt [2008], [5th Edition], The Complete Reference Java2, TATA McGraw-Hill.
2. E Balaguruswamy [2007], [3rd Edition], Programming with Java, A Primer, TATA McGraw-Hill

Reference Books :

1. Bruce Eckel [2008], [2nd Edition], Thinking in Java, Pearson Education.
2. H.M Dietel and P.J Dietel [2008], [6th Edition], Java How to Program, Pearson Ed.

Web References:

1. https://www.tutorialspoint.com/java/index.htm

Question Paper Pattern:

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End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

OPERATING SYSTEM (OS)

IV Semester: CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS210	Professional Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	-	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the OS design structures and its services.

CO2: Understand the concepts of process scheduling, synchronization and its implementation.

CO3: Exemplify the memory management techniques and virtual memory.

CO4: Understand the structure and organization of file system and secondary storage structure.

CO5: Understand Deadlock handling mechanisms, Protection and Security services and Linux Case Study.

UNIT– I

Introduction:

What Operating Systems Do, Operating System Structure, Operating System Operations, Overview of Process Management, Memory Management, Storage Management, Protection and Security, Computing Environments

Operating System Structures:

Operating System Services, User Operating System Interface, System Calls, Types of System Calls, Operating System Structure.

UNIT– II

Process Management:

Processes-Process Concept, Process Scheduling, Operations on Processes, Inter process Communication, Examples of IPC Systems, Threads- Overview, Multicore Programming, Multithreading Models.

***Synchronization*:** Background, The Critical-Section Problem, Peterson's Solution, Semaphores, Classic problems of Synchronization, Monitors.

***Process Scheduling*:**

Basic concepts, Scheduling Criteria, Scheduling Algorithms, Real Time CPU Scheduling-RMS & EDF

UNIT– III

Memory Management:

Main Memory Background, Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page table.

Virtual Memory Background, Demand paging, Page Replacement, Allocation of Frames, Thrashing.

UNIT– IV

Storage Management:

***Mass Storage Structure*:** Overview of Mass-Storage Structure, Disk Structure, Disk Scheduling.

***File System Interface*:** File Concepts, Access Methods, Directory and Disk Structure,

***File System Implementation*-** File system Structure, File system Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

UNIT– V

Deadlocks:

System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Protection and Security:

Protection: Goals of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of access rights,
Security: The Security problem, System and Network Threats.
CASESTUDY: The Linux Operating System:
History, Design Principles, Kernel Modules, Process Management.

Text Books :

1. Silberschatz, Galvin and Greg Gagne, Operating System Concepts, 9th edition, WILEY INDIA Edition.

Reference Books :

1. Operating System : Internals and Design principles, 5th Edition, Willam Stallings Prentice Hall of India.
2. Gagne[2003],[6thEdition],Operating System Concepts, John Wiley & Sons, Inc publishers.
3. Tanenbaum [2000],Modern Operating System, Pearson Education..

Question Paper Pattern:

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The question paper for sessional examination is for 30marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub- questions. i.e there will be two questions from each unit and the student should answer any one question

COMPUTER NETWORKS (CN)

IV Semester: CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS211	Professional Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	-	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand Network models and Physical layer Understand Data Communication Systems, Network models and its Protocols

CO2: Study the techniques used in data link layer.

CO3: Understand the routing strategies for an IP based networking infrastructure.

CO4: Study of congestion control and internetworking concepts.

CO5: Understand connection establishment and services provided by TCP and UDP

UNIT– I

Introduction: Data communications, Networks, Protocols and standards, The OSI Model – Layered architecture, Layers in OSI Model, TCP/IP Protocol Suite, Addressing – Physical addresses, Logical addresses, Port Addresses.

Physical layer and Transmission Media: Analog and digital – Analog and digital data, Analog and digital signals, Digital signals – Bit rate, Bit length, Transmission of digital signals, Transmission Impairments – Attenuation, Distortion and Noise, Performance – Bandwidth, Throughput, Latency, Jitter.

UNIT– II

Data Link Layer: Error detection – Introduction, Block coding – error detection, error correction, hamming distance and minimum hamming distance, CRC codes, Checksum. Framing, Flow and error control.

UNIT– III

Network layer: Design Issues: store-and-forward, services to transport layer, connection less and Connection oriented services, comparison of virtual circuits and datagram subnets.

Routing Algorithms: The optimality principle, shortest path routing, Flooding, Distance vector and Link state, Hierarchical, Broadcast and Multicast Routings.

UNIT– IV

Congestion Control: Principles, congestion prevention policies, congestion control in virtual circuits and datagram subnets, load shedding, jitter control.

Internetworking: Concatenated virtual circuits, connection less internetworking, tunnelling, Internet work routing, Fragmentation. The IP protocol, IP address, Internet Control protocols, Gateway routing protocols: OSPF, BGP.

UNIT– V

Transport Layer: UDP, TCP- service model, protocol, segment header, connection management, Transmission Policy, congestion control and timer management.

Application Layer: The DNS Name Space, Resource Records, Name Servers.

Text Books :

1. Behrouz A. Forouzan [2006][4th Edition], Data communications and Networking, MGH.
2. Andrew S. Tenenbaum [2007], [4th Edition], Computer Networks, Pearson Education.

Reference Books :

1. William Stallings ,Data and Computer Communications, Seventh Edition or Eighth Edition
2. An Engineering Approach to Computer Networks, S.Keshar, [II Edition], Pearson Education.
3. Computer Networking: A Top-Down Approach Featuring the Internet, James F, Keith W.Ross, [V Edition], Pearson Education.
4. Computer networks and internets, Douglas E Comer [6th Edition], Pearson Education.

Web References:

1. https://www.tutorialspoint.com/data_communication_computer_network/index.htm

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End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

DESIGN & ANALYSIS OF ALGORITHMS (DAA)

IV Semester: CSE						**Scheme: 2017**		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CS212	Professional Core	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
		3	**0**	**-**	**3**	**40**	**60**	**100**
Sessional Exam Duration: 2 Hrs						**End Exam Duration: 3 Hrs**		

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

CO1: Understand time, space complexities, notations, Divide and conquer technique to solve problems.

CO2: Understand greedy method to solve problems.

CO3: Understand Dynamic programming technique to solve problems.

CO4: Understand Backtracking and branch & bound techniques and solve problems.

CO5: Understand basic tree traversal and searching techniques and finding the lower bound for various applications

UNIT– I

Introduction: What is an Algorithm? Performance Analysis: Space &Time Complexities, Asymptotic notation, Probabilistic analysis, Amortized analysis.

Divide and Conquer: General method, Binary search, Finding Maximum and Minimum, Merge sort, Quick sort, Strassens Matrix Multiplication.

UNIT– II

Greedy Method : The General Method, Knapsack Problem, Tree Vertex splitting, Job Sequencing with Deadlines, Minimum-Cost Spanning Trees, Optimal Storage on Tapes, Optimal Merge Patterns, Single Source Shortest Paths.

UNIT– III

Dynamic Programming : The General Method, Multistage Graphs, All Pairs Shortest Paths, Optimal Binary Search Trees, String Editing problem, 0/1-Knapsack, Reliability Design, The Travelling Salesperson Problem.

UNIT– IV

Backtracking: The General Method, The 8-Queens Problem, Sum of Subsets, Graph Coloring, and Hamiltonian Cycles.

Branch and Bound: The Method, 15 Puzzle problem, Travelling Salesperson.

UNIT– V

Basic Traversal and Search Techniques: Techniques for Binary Trees, Techniques for Graphs, Bi-connected Components and DFS.

Lower Bound Theory: Comparison Trees, Oracles and Adversary Arguments, Techniques for Algebraic problems.

Text Books :

1. Ellis Horowitz, SartazSahni& Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, Galgotia Publications Second Edition.

Reference Books :

1. Jon Kleinberg, Eva Tardos, Algorithm Design, Pearson Education Seventh Impression.

Question Paper Pattern:

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End Exam

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SOFTWARE ENGINEERING (SE)

IV Semester: CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS213	Professional Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	-	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the phases of software development life cycle and Process models

CO2: Demonstrate Requirement Engineering process and change management

CO3: Understand the design concepts, design models, architectural styles and patterns

CO4: Explain White box testing and Black box testing techniques

CO5: Understand Risk Mitigation Monitoring Management plan, Software Quality Assurance activities and Quality standards

UNIT– I

Introduction To Software Engineering And Process Models: The Evolving role of software, Changing nature of software, Software myths.

Software Engineering: A Layered Technology, A Process Framework.

Process Models: The Waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agile process models.

UNIT– II

***Software Requirement and Requirement Engineering Process*:** Functional and Non-functional requirements, User requirements, System requirements, The Software requirements document.

Requirement Engineering Process: Feasibility studies, Requirements elicitation and Analysis, Requirement validation, Requirement Management.

UNIT– III

Design: Design process and Design quality, Design concepts-Abstraction, Information Hiding, Functional Independence, Refactoring, Modularity, Refinement, Design Classes, Design Model.

Creating an Architectural Design: Software Architecture, Data Design- Data Design at architecture level, Data Design at component level, Architectural Styles & Patterns. Architectural design.

UNIT– IV

***Testing & Metrics*:** Testing Strategies-A Strategic approach to Software testing, Test strategies for Conventional software, White Box Testing- Basis Path Testing, Control Structure Testing, Black Box Testing, Validation Testing, System Testing, The art of Debugging.

Metrics for Process & Products: Software Measurement, Metrics for software quality.

UNIT– V

Risk Management: Risk Management- Reactive vs. Proactive risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM plan.

Quality Management: Quality Management- Quality Concepts, Software quality assurance, Software reviews, Formal technical reviews, Statistical software quality assurance, Software reliability, The ISO 900 quality standards.

Text Books :

1. Roger S.Pressman [2005], [7th Edition], *Software Engineering, A Practitioner's Approach*, Mc Graw Hill, International Edition.
2. Sommerville [2008], [7th Edition], *Software Engineering*, Pearson education.

Reference Books :

1. K.K.Agarwal&Yogesh Singh [2008], *Software Engineering*, New Age International Publishers.
2. James F.Peters,Witoldpedecz,JohnWiely [2008], *Software Engineering-an Engineering approach*.
3. Software Engineering, Pankaj Jalote's , A Precise Approach, Wiley

Web References:

1. 1. https://www.tutorialspoint.com/software_engineering/software_engineering_tutorial.pdf
2. 2.http://www.niecdelhi.ac.in/uploads/Notes/btech/4sem/cse/21378403-Software-Engineering--K-Aggarwal-YogeshSingh-Full-Notes.pdf

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The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10marks each. Each of these questions is from one unit and may contain sub-questions. i.e there will be two questions from each unit and the student should answer any one question

OBJECT ORIENTED PROGRAMING LAB (OOP(P))

IV Semester: CSE					**Scheme: 2017**		
Course Code	**Hours/Week**			**Credit**	**Maximum Marks**		
CS209	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
	0	**0**	**2**	**1**	**50**	**50**	**100**

End Exam Duration: 3 Hrs

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

CO1: Implement class, object and constructor in java.

CO2: Develop programs using packages and Interfaces.

CO3: Perform operations on strings

CO4: Implement the concept of multithreading and file

CO5: Design applets with event handling mechanism

List of Experiments

1. Class, object, Constructor: Student details, complex number arithmetic operations, transpose of a matrix.
2. Inheritance: Multilevel, Hierarchical
3. Packages: Access protection
4. Interface: Multiple inheritance using interface
5. String handling: String class and its methods
6. Exception handling: built-in exceptions and custom exceptions
7. Multithreading: creating multiple thread using Thread class and Runnable interface
8. Files: Reading and writing.
9. AWT controls: Drawing various shapes and factorial of a number
10. Event handling: mouse events and keyboard events

Reference Books :

1. Herbert Schildt [2008], [5th Edition], The Complete Reference Java2, TATA McGraw-Hill.

SOFT SKILLS LAB (SS(P))

III/IV Semester : Common for all Branches				Scheme : 2017		
Course Code	**Hours/Week**			**Credits**	**Maximum Marks**	
HU204	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**TOTAL**
	0	**0**	**2**	**1**	**100**	**100**

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

CO1: Communicate effectively and enhance their interpersonal relationship building skills with renewed self confidence

CO2: Work together in teams and accomplish objectives in a cordial atmosphere

CO3: Face interviews, GDs and give presentations

CO4: Understand and develop the etiquette necessary to present themselves in a professional setting

CO5: Learn the Principles of Personal effectiveness

List of Activities

1. Ice breaking Activities, Principles of Time and Stress Management
2. Art of speaking
3. Art of writing - Essay / Picture / Story
4. Business etiquette - Telephone and email
5. Presentation Skills - Power point making
6. Group Discussion – Objectives and Skills tested in a GD, types of GD, Dos and don'ts & practice
7. Team work - Drama / Skit / Role play
8. Paper / Poster Presentation
9. Problem Solving by lateral thinking puzzles
10. Know your General Awareness / Knowledge – Quiz
11. Principles of Personal excellence
12. Interview Skills

Reference Books :

1. Stephen R. Covey, “The Seven Habits of Highly Effective People”, Pocket Books Publishers, London
2. Priyadarshani Patnaik, “Group Discussion and Interview Skills with VCD”, Foundation Books.
3. Sangeeta Sharma &Binod Mishra, “Communication Skills for Engineers and Scientists”, PHI Learning Private Limited.
4. Shiv Khera, “You Can Win”, MacMillan India Publishers, New Delhi
5. Campus Connect Portals - TCS - https://campuscommune.tcs.com; Infosys - http://campusconnect.infosys.com/

INTRODUCTION TO MICROPROCESSORS & MICROCONTROLLERS (IMMC)

V Semester : CSE						Scheme : 2017		
Course Code	Course Category	Hours/Week			Credits	Maximum Marks		
EC313	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration : 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the pin structure, architecture of 8086 microprocessor.

CO2: Understand the operations and internal block description l of 8086 microprocessor.

CO3: Apply the programming model of 8086 microprocessor for Assembly language programs.

CO4: Understand the pin structure, architecture and operations of 8051 microcontroller.

CO5: Apply the programming model of 8051micrcontrollerfor Assembly language programs.

UNIT I

Basics of Microprocessors: Block Diagram and Features of 8085 microprocessor, 8086 CPU architecture, Pin Diagram of 8086 microprocessor, comparison of 8085 and 8086 microprocessors.

UNIT II

8086 Operations: Segmented memory, Physical Memory Organization, Operating modes, Addressing modes, 8086 instruction set

UNIT III

Programming and Interfacing using 8086: Simple programs on Arithmetic operations, Sorting, Searching. Introduction to 8255 (Programmable Peripheral Interface) and it's CWR, 8251(USART), 8259 (Programmable Interrupt Controller).

UNIT IV

Introduction to 8051 Microcontroller: Pin Diagram, Architecture, Input / Output ports and circuits, External memory, counters and Timers, Serial data input/output, interrupts.

UNIT-V

8051 Programming: Addressing Modes, Instruction set. Basic Programming with 8051 Micro controller. Interfacing LEDs, Switches.

Text Books :

1. A K Ray, K M Bhurchandi, *Advanced Microprocessors and Peripherals*, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2010.
2. Mazidi Muhammad Ali, Mazidi Janice Gillespie & McKinlay Rolin D, *The 8051 Microcontroller and Embedded Systems*, 2nd Edition, Pearson Education, 2008.

Reference Books :

1. John Uffenbeck, *The 8086/8088 Family: Design, Programming, and Interfacing*, 3rd Edition, Pearson Ed, 2006.
2. Barry B. Brey, *The Intel Microprocessors-Architecture, Programming and Interfacing*, 8th Edition, Princeton Hall India, 2009.
3. Kenneth J. Ayala, *The 8051 Microcontroller*, Penram International Publication Ltd, 2006.

4. Gaonkar Ramesh, *Microprocessors Architecture, Programming & Applications with 8085/8080A*, 5th Edition, Penram International Publication Ltd, 2010.

5. N. Senthil Kumar, M. Saravanan, S. Jeevananthan, *Microprocessors and Interfacing,* OUP India, 2012.

Web References:

1. www.nptel.onlinecourseac.in/.microprocessorsandmicrocontrollers

Question Paper Pattern:

Sessional Exam:

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each

End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

DATA MINING (DMG)

V Semester: B.Tech-CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS301	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration:3 Hrs.		

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

CO1: Understand the importance of data mining and the principles of business intelligence.

CO2: Organize and Prepare the data needed for data mining using pre-processing techniques.

CO3: Understand data mining classification technique using classifiers.

CO4: Implement Market based analysis using association rule mining

CO5: Analyze unsupervised clustering mining algorithms.

UNIT– I

Data Mining:

Introduction, What is Data Mining, Motivating Challenges, Data Mining Tasks, Types of Data, Similarity and Dissimilarity between Simple Attributes and Data Objects.

UNIT– II

Data Preprocessing:

Why Pre-process the Data?, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT– III

Classification:

Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Working of Decision Tree, Building a decision tree, methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for Decision Tree Induction, Rule Base, Nearest-Neighbour Classifier, Bayes Theorem, using the Bayes theorem for classification, Naive Bayes Classifier.

UNIT– IV

Association Analysis:

Basic Concepts and Algorithms: Frequent Item Set generation, The Apriori Principle, Apriori Algorithm, Candidate Generation and Pruning, Rule Generation, Confidence-Based Pruning, Rule Generation with an example, FP-Growth Algorithm.

UNIT– V

Cluster Analysis:

What is Cluster Analysis, Types of Clustering, K-Means Algorithm, Agglomerative Hierarchical Clustering Algorithm, Key Issues in Hierarchical Clustering, DBSCAN Algorithm.

Text Books :

1. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, PEA
2. Data Mining concepts and Techniques, 3/e, Jiawei Han, Michel Kamber, Elsevier,2006

Reference Books :

1. Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH.
2. Data Mining Techniques, Arun K Pujari, Universities Press.

Web References:

1. https://onlinecourses.nptel.ac.in/noc18_cs14/
2. https://freevideolectures.com/course/3758/databases-data-mining

Question Paper Pattern:

Sessional Exam

The question paper for sessional examination is for 40 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

FORMAL LANGUAGES AND AUTOMATA THEORY (FLAT)

V Semester: B.Tech-CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS303	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs		

Course Out comes: At the end of the course students will be able to

CO1: Design the finite automata for a given regular language.

CO2: Understand the regular expressions and pumping lemma of regular languages.

CO3: Understand the regular grammar, context free grammar and pumping lemma for CFL.

CO4: Design push down automata and context free grammar for a given context free language.

CO5: Design the Turing machine for the given formal language.

UNIT– I

Finite Automata preliminaries: Strings, Alphabet, Language Operations, Finite State Machine definitions, Finite Automation Model, Acceptance of strings and languages, Non-deterministic Finite Automation, Equivalence between NFA and DFA, conversion of NFA into DFA, Equivalence between two FSM's, Minimization of FSM, Moore and Mealy machines, Applications of FA's.

UNIT– II

Regular Expressions and Regular Sets: Regular sets, Regular expressions, Identity rules, Manipulation of regular expression, Equivalence between RE and FA, Inter conversion, Pumping lemma for RE, Closure properties of regular sets.

UNIT– III

Grammar Formalism: Regular Grammar-Right linear grammar and left linear grammar, Equivalence between regular linear grammar and FA, inter-conversion between RE and RG, Derivation trees, Right most and left most derivation of strings.

Context Free Grammar: Context Free Grammar, Ambiguity in CFG, minimization of CFG, Chomsky Normal Form, Griebach Normal Form, pumping lemma of CFL.

UNIT– IV

Push Down Automata: Definition of the Pushdown Automaton, A Graphical Notation for PDA's, Instantaneous Descriptions of a PDA, The Languages of a PDA, Acceptance by Final State, Acceptance by Empty Stack, Equivalence of PDA's and CFG's, Properties of Context Free Languages.

UNIT– V

Turing Machines: Introduction to Turing Machines, Notation for the Turing Machine, Instantaneous Descriptions for the Turing Machines, Transition Diagrams for Turing Machines, The Language of a Turing Machine, Universal Turing machine, Halting problem of Turing Machine.

Text Books:

1. J.E.Hopcroft, Rajeev Motwani and J.D.Ullman, Introduction to Automata Theory Languages and Computation, Third edition, 2007, Pearson Education.
2. Mishra and Chandrashakaran, [2008], [Third Edition], Theory of computer sciences: Automata languages and computation, Third Edition, 2008, PHI.

Reference Books:

1. John C Martin, Introduction to languages and the theory of computation, Third edition, 2007, TMH.
2. Peter Linz, An Introduction to Formal Languages and Automata, Fourth edition, 2010, Narosa Book Distributors Pvt. Ltd.
3. Michael Sipser, Introduction to Theory of Computation, 3rd Edition, 2012, Cengage Learning.
4. Bernar M Moret, The Theory of Computation, First edition, 2002, Pearson Education.

Web References:

1. https://nptel.ac.in/courses/111103016/
2. https://www.tutorialspoint.com/automata_theory/

Question Paper Pattern:

Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

Note: JFLAP software is used to design the models of DFA, NFA, Moore machine, Mealy machine, PDA and TM.

WEB TECHNOLOGIES (WT)

V Semester: B.Tech-CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS304	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs		

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

CO1: Design a Web Page using Text Formatting Tags, Hyperlinks.

CO2: Develop a webpage with Images, Tables

CO3: Understand the concepts of CSS, Lists.

CO4: Design a web page using Frames, dynamic web pages using JavaScript

CO5: Design a Form using HTML Forms & Controls.

CO6: Understand the concepts of XML.

UNIT– I

HTML5: Overview of HTML5 and other web technologies, HTML5 and its essentials, Fundamentals of HTML5,Working with Text and organizing Text in HTML, Working with Links and URLs.

UNIT– II

Images: Working with Images, Image Maps, Creating Tables.
CSS: Overview of CSS, Backgrounds and Color Gradients in CSS, Fonts and Text Styles, List Styles, Table Layouts.

UNIT– III

***Frames*:** Creating Frames using CSS, Displaying Positioning and Floating an Element using CSS.
JavaScript*:* Overview of java script, Functions, Events, Java script Objects, Working with Browser Objects, Document Object, Document Object Model, Validation, Errors, Exception Handling in JavaScript.

UNIT– IV

Forms: What's a Form? What Controls are available? Creating a Form and adding HTML Controls, Submitting Data from forms, Customizing Controls in CSS.

UNIT– V

Working with Basics of XML: Comparing XML with HTML, Advantages and Disadvantages of XML, Structure of XML documents, Exploring XML parsers, Describing DTD and XML Schemas.

Text Books:

1. HTML5 Black Book,2nd Edition, Dreamtech Press,2016.

Reference Books:

1. Robert Pattinson, Beginners Guide for HTML and CSS Web Design and Web Development,2018
2. John P. Rhynes, HTML5 and CSS3 The Basics, Introduction for Beginners,2018.
3. Ikram-Hawramani, HTML & CSS for Complete Beginners: A Step by Step Guide to Learning HTML5 and CSS3, 2018
4. John Dean, Web Programming with HTML5, CSS, and JavaScript ,2018

Web References:

1. https://www.w3schools.com/Html
2. https://www.tutorialspoint.com/Html/index.htm

Question Paper Pattern:

Sessional Exam

The question paper for session examination is for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No1 which carries 6 marks contains three short answer two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

Note:

1. Tools like Adobe Dreamweaver, Bootstrap can be used to create and manage websites.

DATA MINING LAB (DMG(P))

V Semester: B.Tech-CSE					Scheme: 2017		
Course Code	Hours/Week			Credits	Maximum Marks		
CS302	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Duration: 2Hrs.					End Exam Duration: 3 Hrs		

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

CO1: Learn to execute data mining tasks using a data mining toolkit WEKA.

CO2: Analyze Data preprocessing techniques on raw input data and process it for mining.

CO3: Demonstrate the classification techniques on large datasets.

CO4: Apply the working of algorithms for data mining tasks such as association rule mining, clustering.

List of Experiments

1. Introduction to WEKA and create an arff dataset.
2. Create a Weather Table with the help of Data Mining Tool WEKA.
3. Demonstration of preprocessing techniques to the training data set of Weather Table.
4. Write a Procedure to Normalize Weather Table data using Knowledge Flow.
5. Demonstrate Construction of Decision Tree for Weather data and classify it.
6. Write a procedure for Visualization of Weather Table.
7. Write a procedure in finding Association Rules for Buying Data.
8. Demonstration of Association rule process on dataset test.arff using apriori algorithm.
9. Write a procedure for Clustering Customer data using Simple K-Means Algorithm.
10. Write a procedure for Employee data using Make Density Based Cluster Algorithm.

References :

1. Introduction to Data Mining Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson
2. http://www.cs.waikato.ac.nz/ml/weka/

ALGORITHMS AND COMPUTER NETWORKS LAB (ACN(P))

V Semester: B.Tech- CSE					Scheme: 2017		
Course Code	Hours/Week			Credits	Maximum Marks		
CS305	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Duration:2 Hrs					End Exam Duration:3 Hrs		

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

CO1: Implement divide and conquer techniques.

CO2: Implement greedy method.

CO3: Implement dynamic programming and graph traversal techniques.

CO4: Implement the techniques used in data link layer.

CO5: Implement the routing algorithms.

List of Experiments

1. Merge sort using divide and conquer
2. Binary search using divide and conquer
3. Prim's algorithm using greedy method
4. 0/1 knapsack problem using dynamic programming
5. Depth first search
6. Cyclic Redundancy Code
7. Dijkstra's algorithm
8. Distance vector routing algorithm
9. Link state routing
10. Domain name server

Reference Books:

1. Behrouz A. Forouzan [2006] [4th Edition], Data communications and Networking, MGH.
2. Andrew S. Tenenbaum [2007], [4th Edition], Computer Networks, Pearson Education.

MACHINE LEARNING (ML)

VI Semester: B.Tech-CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS311	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs		

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

CO1: Understand the machine learning concepts and the main steps in a typical machine learning project.

CO2: Build a digit image classifier on MNIST dataset.

CO3: Build a linear regression model using direct closed form equation and Gradient Descent approaches, polynomial regression model, softmax regression model.

CO4: Understand the core concepts and working of Support Vector Machines, Decision trees and CART training algorithm.

CO5: Understand popular ensemble methods-bagging and pasting, random forests, dimensionality reduction techniques-PCA, Kernel PCA and clustering algorithms-k-Means, DB Scan

UNIT– I

Machine Learning Landscape

Introduction, Types of Machine Learning Systems, Challenges, Testing and Validating

End-to-End Machine Learning Project

Working with Real data, Look at the big picture, Launch, Monitor and Maintain your system

UNIT– II

Classification

MNIST, Training a Binary Classifier, Performance measures, Multiclass classification, Error analysis, Multilabel classification, Multioutput classification

UNIT– III

Training Models

Linear Regression, Gradient Descent, Polynomial Regression, Learning Curves, Regularized Linear Models, Logistic Regression

UNIT– IV

Support Vector Machines

Linear SVM classification, Nonlinear SVM classification, SVM Regression

Decision Trees

Training and visualizing a decision tree, Making predictions, Estimating class probabilities, CART Training algorithm, Computational complexity, Gini Impurity or Entropy, Regularization Hyper parameters, Regression

UNIT– V

Ensemble Learning and Random Forests

Voting classifiers, Bagging and pasting, Random patches and Random subspaces, Random forests

Dimensionality Reduction

Curse of dimensionality, Main approaches for Dimensionality Reduction, PCA, Kernel PCA

Unsupervised Learning Techniques

Clustering algorithms - K-Means, DB Scan

Text Books:

1. Aurelian Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to build Intelligent Systems", OReilly Publications, First Edition, 2017
2. Tom M.Mitchell, "Machine Learning", Mc Graw Hill Education, Indian Edition, 2013

Reference Books:

1. Oliver Theobald, "Machine Learning for Absolute Beginners", Second Edition, 2017
2. Ethem Alpaydin," Introduction to Machine Learning", The MITPress, Third Edition, 2014
3. Miroslav Kubat, "An Introduction to Machine Learning" , Springer, 2017

Web References:

1. *https://www.coursera.org/learn/python-machine-learning* offered by University of Michigan
2. *https://scikit-learn.org/stable/*
3. *https://github.com/ageron/handson-ml.*
4. *https://www.coursera.org/learn/python-data-analysis?specialization=data-science-python*
5. *https://www.coursera.org/learn/python-plotting?specialization=data-science-python*
6. *http://learnpython.org/*

Question Paper Pattern:

Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

COMPILER DESIGN (CD)

VI Semester: B.Tech-CSE						Scheme: 2017		
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
CS313	Program Core	3	0	0	3	**40**	**60**	**100**
Sessional Exam Duration:2 Hrs						**End Exam Duration:3 Hrs**		

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

CO1: Understand the phases of compiler and compiler construction tools.

CO2: Identify tokens in the source program using lexical analyzer technique.

CO3: Develop top-down and bottom-up parsers for the given grammar.

CO4: Develop type checking semantic rules using synthesized and inherited attributes.

CO5: Develop optimized intermediate code using code optimization techniques.

CO6: Understand target code generation using flow graph and DAG representations of input source code.

UNIT– I

Compilers:

Basic function of Language translator, differences between compiler and interpreter, bootstrapping, logical phases of a compiler, differences between pass and phase, grouping the phases into passes, compiler construction tools.

Lexical Analysis:

The role of lexical analyzer, input buffering, specifications of tokens, recognition of tokens, a language for specifying lexical analyzers, LEX tool.

UNIT– II

Syntax Analysis:

Role of parser, top down parsing, recursive decent parsing, predictive parsers, non-recursive predictive parsing, bottom up parsing, operator precedence parsing, LR parsers, using ambiguous grammars, YACC parser generator.

UNIT– III

Semantic Analysis:

Typical semantic errors, type checking, type conversions, specification of a simple type checker, equivalence of type expressions, overloading of functions and operators, polymorphic functions, strategies of storage allocation: static, dynamic and heap.

Syntax-Directed Translation:

Syntax-Directed Definitions, Construction of Syntax Trees, Bottom-Up Evaluation of S-Attributed Definitions, L-Attributed Definitions, Top Down Translation, Bottom-Up Evaluation of Inherited Attributes.

UNIT– IV

Intermediate Code Generation:

Intermediate code languages, three address code, types of three address code, syntax directed translation into three address code, implementations of three address statements - quadruples, triples, indirect triples, Boolean expressions, back patching.

Code Optimization:

Introduction to code optimization, principles sources of optimization, optimization of basic blocks, peephole optimization.

UNIT– V

Code Generation:

Issues in the design of code generator, the target machine, basic blocks and flow graphs, next use information, a simple code generator, DAG representation of basic blocks, generating code from DAGs.

Text Books :

1. Alfred V.Aho, Ravi Sethi, Jeffrey and D.Ullman, Compilers Principles, Techniques and tools, Pearson edition, 2014

Reference Books :

1. KVN Sunitha, Compiler Construction, Pearson, 2013.
2. Keith D Cooper & Linda Torczon, Engineering a Compiler, Second Edition, MK (Morgan Kaufmann), Elsevier, 2008.
3. Parag H Dave, Himanshu B Dave, Compiler Principles and Practice, Pearson, 2012.
4. Sandeep Saxena, Rajkumar Singh Rathore, Compiler Design, S Chand Publications, 2013.

Web References:

1. https://nptel.ac.in/courses/106104072/
2. https://www.geeksforgeeks.org/compiler-design-tutorials/
3. https://www.tutorialspoint.com/compiler_design/
4. https://www.javatpoint.com/compiler-tutorial

Question Paper Pattern:

Sessional Exam:

The question paper for Sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second Sessional exam. Question No 1, which carries 6 marks, contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

Note:

1. The modern tool “Flex” can be used to demonstrate Lex and YACC topics in UNIT-1 and UNIT-2 respectively.

MOBILE COMPUTING (MCP)

VI Semester: B.Tech-CSE						Scheme: 2017		
CourseCode	Category	Hours/Week			Credits	Maximum Marks		
CS315	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs		

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

CO1: Understand the basic concepts of wireless communication & mobile computing.

CO2: Understand the wireless medium access controlling mechanisms and GSM.

CO3: Understand the WLAN System Architecture, Protocol Architecture, Physical Layer.

CO4: Acquiring knowledge on the structure & concepts of Mobile IP.

CO5: Understand the Traditional TCP and Classical Improvements of TCP.

UNIT– I

Wireless transmission: Frequencies for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation (ASK, FSK, PSK) Spread spectrum, Cellular systems.

UNIT– II

Medium access control: Motivation for a Specialized MAC, SDMA, FDMA, TDMA (Fixed TDM, classical Aloha, Slotted Aloha, CSMA), CDMA, Comparison of S/T/F/CDMA.

GSM: Mobile services, System Architecture, Radio interface, Protocols, Localization and calling, Handover.

UNIT– III

Wireless LAN: Infrared Vs Radio Transmission, Infra Red and ad-hoc network,

IEEE 802.11: System architecture, Protocol architecture, Physical layer, Medium access control layer, MAC management.

UNIT– IV

Mobile IP: Goals & requirements, Entities and terminology, IP Packet delivery, Agent discovery, Registration, Tunnelling & Encapsulation, Optimizations, Reverse tunneling, IPv6, Dynamic host Configuration protocol.

UNIT– V

Traditional TCP: Congestion control, Slow start, Fast retransmit/fast recovery, implications of mobility, Classical TCP improvements.

Text Books :

1. Jochen Schiller [2008], [Second Edition], *Mobile Communications*, Low price edition, Pearson

Reference Books :

1. Talukder [2008], *Mobile Computing: Technology, Applications & service creation*, TMH.

Web References:

1. https://sgar91.files.wordpress.com/2011/10/mobile_communications_schiller_2e.pdf
2. https://www.pearson.com/us/higher-education/program/Schiller-Mobile-Communications-2nd-

Question Paper Pattern:

Sessional Exam

The question paper for sessional examination is for 30 marks, covering half of the syllabus for first Sessional and remaining half for second sessional exam. Question No1which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions i.e. there will be two questions from each unit and the student should answer any one question.

MEACHINE LEARNING LAB (ML(P))

VI Semester: B.Tech- CSE					Scheme: 2017		
Course Code	Hours/Week			Credits	Maximum Marks		
CS312	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs	

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

CO1: Build a machine learning model for a given data set.

CO2: Use Scikit-Learn toolkit for building machine learning models

List of Experiments

1. Scikit-Learn -- Practice
2. Build a digit image classifier on MNIST dataset.
3. Build a linear Regression model for a given data set
4. Support Vector machines
5. Training and Visualizing a decision tree
6. Ensemble Learning
7. Random Forests
8. Dimensionality Reduction Technique - PCA
9. Clustering algorithm – k-Means

Reference Books :

1. Aurelian Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow : Concepts,
2. Danish Haroon, "Python Machine Learning Case Studies" , Apress
3. Peter Harrington, "Machine Learning in Action", Manning Publications, 2012

COMPILER DESIGN LAB (CD(P))

VI Semester: B.Tech- CSE					Scheme: 2017		
Course Code	Hours/Week			Credits	Maximum Marks		
CS314	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Duration:2 Hrs					End Exam Duration:3 Hrs		

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

CO1: Implement DFAs, LA and Parser.

CO2: Implement Top Down and Bottom up parsing methods.

CO3: Design a Type checking system.

CO4: Construct DAG, Code generation and Code optimization.

List of Experiments

1. Implementation of Deterministic finite automata (DFAs).
2. Implementation of Symbol Table.
3. Lexical analyzer using Lex tool.
4. Yacc program to recognize a valid arithmetic expression.
5. First and Follow sets of a given grammar.
6. Implement Shift reduce parsing.
7. Operator precedence parsing.
8. Implement Type checking system.
9. Stack storage allocation technique.
10. Construction of Directed Acyclic Graphs(DAGs).
11. Construction of Code Generation from Three Address Code.
12. Implementation of Code Optimization techniques.

Additional Experiments

1. Elimination of Left Recursion of a Grammar.
2. Find Left factor of a Grammar.
3. Construct a Parse Tree for a String.
4. Implementation of Non-Recursive predictive parsing.
5. Construct a parsing table.

Reference Books :

1. Alfred V. Aho,Ravi Sethi, J.D.Ullman,[2nd Edition],Compilers principles techniques and tools, Pearson Education, 2009.

NETWORK SECURITY AND CRYPTOGRAPHY (NSC)

VII Semester: B.Tech-CSE					Scheme: 2017			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS401	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs					End Exam Duration:3 Hrs			

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

CO1: Illustrate the concepts and principles of computer network security.

CO2: Understand various classical encryption techniques and block cipher structure.

CO3: Analyze advanced encryption standard.

CO4: Understand block cipher operations.

CO5: Explain various asymmetric ciphers.

CO6: Understand cryptographic hash functions and digital signatures.

UNIT– I

Introduction to Security concepts

Computer security concepts, OSI Security Architecture, Security attacks, Security services, Security mechanisms, Fundamental security design principles, A model for Network Security.

Number Theory

Euclidean Algorithm, Modular Arithmetic, Fermat's and Euler's Theorem, Testing for primality.

UNIT– II

Symmetric Ciphers

Classical Encryption Techniques: Symmetric cipher model, Substitution techniques, Transposition techniques, Steganography.

Block Ciphers and DES

Traditional block cipher structure, Data Encryption Standard, DES Example, Strength of DES, Block cipher design principles.

UNIT– III

Advanced Encryption Standard

AES Structure, AES transformation functions, AES Key Expansion, AES Example, AES Implementation.

Block Cipher Operation

Multiple Encryption and Triple DES, Electronic codebook, Cipher Block Chaining Mode, Cipher feedback mode, output feedback mode.

UNIT– IV

Asymmetric Ciphers and Public key cryptosystems

Public-Key Cryptography and RSA: Principles of Public-key cryptosystems, RSA Algorithm. Diffie-Hellman Key Exchange, Elgamal Cryptographic systems.

UNIT– V

Cryptographic Hash Functions

Applications of cryptographic hash functions, Hash functions based on cipher block chaining, SHA.

Message Authentication codes:

Requirements, Message authentication functions, security of MACs.

Digital Signatures

Digital Signature requirements, Elgamal Digital Signature, Schnorr Digital Signature scheme.

Text Books :

1. William Stallings, [7th Edition], Cryptography and Network Security, Pearson.
2. Behrouz A. Forouzan, D Mukhopadhayay, [2nd Edition], Cryptography and Network Security, MC Graw Hill

Reference Books :

1. Eric Cole, Dr. Ronald Kurtz and James W. Conley, Network Security Bible, Wiley Publishers, 2009
2. Bruce C.Berndt, Number Theory in the Spirit of Ramanujan‖, University Press
3. V.K. Jain, Cryptography and Network Security, Khanna Publishing House.
4. Atul Kahate, Cryptography and Network Security, TMH

Question Paper Pattern:

Sessional Exam

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End Exam

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER / OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions .i.e. there will be two questions from each unit and the student should answer any one question.

BIG DATA ANALYTICS (BDA)

VII Semester: B.Tech CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS403	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	-	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the basics of Big Data Analytics,Hadoop.

CO2: Design Map Reduce programs for a given problem.

CO3: Write Pig Scripts on Hadoop that works on large datasets.

CO4: Perform Data Querying Operations using Apache Hive.

CO5: Implement Data Management using NoSQL Databases.

UNIT– I

Big Data Analytics:

What is Big Data Analytics, why this Sudden Hype Around Big Data Analytics? Classification of Analytics, Top Challenges Facing Big Data, Few Top Analytics Tools.

Introduction to Hadoop:

Introducing Hadoop, HDFS, HDFS Commands, Processing Data with Hadoop,Managing Resources and Applications with Hadoop YARN, Interacting with Hadoop EcoSystem.

UNIT– II

Understanding *Map Reduce & YARN:*

The Map Reduce Framework Concept, Developing Simple Map Reduce Application,Points to consider While Desining Map Reduce, YARN Background,YARN Architecture,Working of YARN.

UNIT– III

Analyzing Data with Pig:

Introducing PIG, Running PIG, Getting started with pig Latin, Working with operators in pig, Debugging pig.

UNIT– IV

Understanding HIVE:

Introducing Hive,Hive Services, Built in functions in Hive,Hive DDL,Data Manipulation in Hive.

UNIT– V

NoSQL Data Management:

Introduction to NoSQL, Characteristics of NoSQL, Types of NoSQL Data Models,Schema-less Databases.

Text Books:

1. Big Data Black Book: Covers Hadoop 2, Map Reduce, Hive,YARN, Pig, R and Data Visualization by DreamTech,2015.
2. Big Data and Analytics by Seema Acharya,Wiley Publication,2015.

Reference Books:

1. Data Science & Big Data Analytics: Discovering, Analyzing, Presenting Data Visualizing.
2. Hadoop: The Definitive Guide, 3rd Edition , By Tom White , O'reilly Media
3. Big Data Now: 2012 Edition Publisher: O'Reilly Media.
4. Too Big to Ignore: The Business Case for Big Data (Wiley and SAS Business Series) By Phil Simon, Wiley 1e.

Question Paper Pattern:

Sessional Exam

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Note:

1. Cloudera environment or Hadoop can be used to demonstrate various Hadoop Ecosystem for all the units.
2. Apache Hadoop is open source software for analyzing Big data. This is applicable for UNIT-I.
3. Map Reduce Programs are designed for data processing correspondingly in UNIT-II.
4. Apache pig is a tool used for data processing applicable for UNIT-III.
5. Apache Hive gives SQL like Interface to Query Data in UNIT-IV
6. Analysis type of questions can be given for Assignment from UNIT-II and UNIT-III.

SOFTWARE PROJECT MANAGEMENT (SPM)

VII Semester: B.Tech- CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS405	Program Core	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Define the purpose of project management and programme management.

CO2: Discuss project planning and process models.

CO3: Estimate effort of software project using effort estimation techniques.

CO4: Describe risk categories and steps to monitor, control the project.

CO5: Understand the importance of team work and software quality.

UNIT– I

Introduction to Software Project Management: What is a project, Activities covered by Software Project Management, Plans Methods and Methodologies, Ways of categorizing software projects, Stakeholders, Setting Objectives, The Business Case, Project success and failure, What is Management and Management control, Traditional and Modern Project Management Practices.

Project Evaluation and Programme Management: A Business Case, Project Portfolio Management, Evaluation of individual projects, Cost-benefit Evaluation Techniques, Risk Evaluation, Programme Management, Strategic Programme Management, Creating a Programme, Aids to programme management, Benefits Management.

UNIT– II

An overview of Project Planning: Introduction to Step Wise Project Planning

Selection of an Appropriate Project Approach: Choosing Methodologies and Technologies, Software Processes and Process Models, The Waterfall Model, The Spiral Model, Software Prototyping, Incremental Delivery, Rapid Application Development, Agile Methods, Extreme Programming, Scrum, Managing Iterative Processes, Selecting the Most Appropriate Process Model.

UNIT– III

Software Effort Estimation: Introduction, Where are Estimates done, Problems with Over and Under estimates, The basis for Software Estimating, Software Effort Estimation Techniques, Estimation by Analogy, Albrecht Function Point Analysis, Function Points Mark II, COSMIC Full Function Points, COCOMO II: A Parametric Productivity Model, Staffing Pattern, Effect of Schedule Compression, Caper Jones Estimating Rules of Thumb.

UNIT– IV

Risk Management: Risk, Categories of Risk, A Framework for dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Evaluating Risks to the Schedule, Applying the PERT Technique.

Monitoring and Control: Creating the Framework, Collecting the Data, Review, Project Termination Review, Visualizing Progress, Cost Monitoring, Earned Value Analysis, Prioritizing Monitoring, Getting the Project Back to Target, Change Control, Software Configuration Management.

UNIT– V

Working in Teams: Introduction, Becoming a Team, Decision Making, Organization and Team Structures, Coordination Dependencies, Dispersed and Virtual Teams, Communication Genres, Communication Plans, Leadership.

Software Quality: The place of Software Quality in Project Planning, Importance of Software Quality, Defining Software Quality, ISO 9126, Product and Process Metrics, Product versus Process Quality Management, Quality Management Systems, Process Capability Models, Techniques to help enhance Software Quality.

Text Books :

1. Software Project Management, Bob Hughes, Mike Cotterell & Rajib Mall, Fifth edition, Tata McGraw Hill Education (India) Private Limited, 2011.
2. Software Project Management, Walker Royce, Pearson Education, 2012.

Reference Books :

1. Software Project Management, S.A.Kelkar, Second Edition, PHI, 2011.
2. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
3. The art of Project Management, Scott Berkun, O'Reilly, 2005.
4. Software Project Management in Practice, Pankaj Jalote, Pearson Education, 2002.

Web References:

1. https://www.tutorialspoint.com/software_engineering/software_project_management.htm
2. https://en.wikipedia.org/wiki/Software_project_management

Question Paper Pattern:

Sessional Exam

The question paper for sessional examinations for 30 marks, covering half of the syllabus for first sessional and remaining half for second sessional exam. Question No. 1 which carries 6 marks contains three short answer questions of two marks each. The remaining three questions shall be EITHER/OR type questions carrying 8 marks each.

End Exam

Question paper contains six questions. Question 1 contains 5 short answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions i.e there will be two questions from each unit and the student should answer any one question.

Note:

1. Give an assignment on how to select the most appropriate process model for a given project from UNIT – II.
2. Solve problems and give assignment on effort estimation techniques from UNIT-III.
3. Form teams and assign small projects to take up as a team from UNIT-V.

NETWORK SECURITY AND CRYPTOGRAPHY LAB (NSC (P))

VII Semester: B.Tech-CSE					Scheme: 2017		
Course Code	Hours/Week			Credits	Maximum Marks		
CS402	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
	0	0	2	1	50	50	100
Sessional Exam Duration:2 Hrs					End Exam Duration:3 Hrs		

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

CO1: Perform basic concepts from number theory.

CO2: Implementation of encryption and decryption using substitution techniques.

CO3: Perform encryption and decryption using transposition techniques.

CO4: Implementation of encryption and decryption using DES and RSA algorithms.

CO5: Develop programs for various public key cryptosystems.

List of Experiments

1. Implementation of basic Euclidean algorithm.
2. Perform Fermat's primality test.
3. Encrypt and decrypt a message using Caesar cipher
4. Encrypt and decrypt a message using Hill cipher
5. Encrypt & decrypt a message using Transposition Cipher
6. Implementation of DES algorithm
7. Implementation of RSA algorithm
8. Perform Diffie-Hellman Key Exchange
9. Implementation of Elgamal Cryptographic system

Reference Books :

1. William Stallings, [7th Edition], Cryptography and Network Security, Pearson.
2. Behrouz A. Forouzan, D Mukhopadhayay, [2nd Edition], Cryptography and Network Security, MC Graw Hill.

BIG DATA ANALYTICS LAB (BDA(P))

VII Semester: B.Tech- CSE					**Scheme: 2017**		
Course Code	**Hours/Week**			**Credits**	**Maximum Marks**		
CS404	**L**	**T**	**P**	**C**	**Continuous Internal Assessment**	**End Exam**	**TOTAL**
	0	0	2	1	**50**	**50**	**100**
Sessional Exam Duration: 2Hrs.					**End Exam Duration:3Hrs**		

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

CO1: Demonstrate Hadoop Commands in Ubuntu environment.

CO2: Design Map Reduce Programs to different problems.

CO3: Implement Pig on Hadoop Framework and perform basic operations.

CO4: Perform DDL operations using Hive on Hadoop.

List of Experiments

1. Perform Hadoop Setup in Local and Pseudo mode and monitor through Web Based UI.
2. Implementation of Hadoop Shell Commands on files.
3. Implementation of word count Example using Hadoop Map Reduce.
4. Write a Map Reduce Program that works on Gutenberg data.
5. Write a Map Reduce Program that mines weather data.
6. Write Pig Latin Scripts on Describe, for each and order by operator.
7. Write Pig Latin scripts to perform set and sort operation.
8. Perform DDL Operations on Hive.
9. Implementation of Data Management using NoSQL Databases.

Reference Books :

1.Big and Hadoop Learn by examples by Mayank Bhushan, BPB Publications, First Edition ,2018

DATA SCIENCE with R (DSR)

VII Semester: B.Tech-CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS411	Open Elective - 3	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration:3 Hrs		

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

CO1: Understand the analytical life cycle of a data science project

CO2: Demonstrate the Basic Concepts of R Programming

CO3: Apply various visualization methods for representation of results

CO4: Organize the data for the modeling process

CO5: Evaluate the quality of model

UNIT– I

Introduction to data science:

The roles in a data science project , Stages of a data science project, Defining the goal, Data collection and management, Modelling, Model evaluation and critique, Presentation and documentation, Model deployment and maintenance.

UNIT– II

Introduction to R Programming:

Understanding Data Structures in R – Lists, Matrices, Vectors Basic Building Blocks in R, Basic Operations Operators and Types, Handling Missing Values in R, Subsetting Vectors in R, Matrices and Data Frames in R, Logical Statements in R, Lapply, Sapply, Vapply and Tapply Functions

UNIT– III

Data Visualization using R:

Statistical models in R, Packages, A sample session.

Introduction to graphical Analysis: Box-whisker plots, Scatter Plots, pair plots, Line charts, pie charts, Dot charts, Bar Charts.

UNIT– IV

Loading data into R:

Working with data from files, working with well-structured data from files or URLs, Using R on less-structured data, Transforming data in R, Examining our new data.

Exploring data: Using summary statistics to spot problems, Typical problems revealed by data summaries, Spotting problems using graphics and visualization.

Managing Data: Cleaning Data, Data Transformations, Sampling for Modeling And Validation.

UNIT– V

Choosing and Evaluating models:

Mapping problems to machine learning tasks, Solving classification problems, Solving scoring problems, Working without known targets, Problem-to-method mapping.

Evaluating models: Evaluating classification models, Evaluating scoring models, Evaluating clustering models, Validating models**,** Linear and logistic regression, Data Analysis Case Study.

Text Books :

1. Practical Data Science with R by Nina Zumel ,John Mount, Manning Publications,2016
2. R Programming for Data Science, by Roger D. Peng, https://leanpub.com/rprogramming

Reference Books :

1. Hands-On Programming with R: Write Your Own Functions and Simulations by Garrett Grolemund
2. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition by Hadley Wickham ,Garrett Grolemund

Web References:

1. www.r-project.org/about.html
2. www.dataquest.io
3. www.tutorialspoint.com/r/index.htm

Question Paper Pattern:

Sessional Exam:

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End Exam:

Question Paper Contains Six Questions. Question 1 contains 5 short Answer questions each of 2 marks. (Total 10 marks) covering one question from each unit. The remaining five questions shall be EITHER/OR type questions carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. i.e. there will be two questions from each unit and the student should answer any one question.

CLOUD COMPUTING (CC)

VII Semester: CSE						Scheme: 2017		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS409	Professional Elective	L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
		3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs						End Exam Duration: 3 Hrs		

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

CO1: Understand the layers and types of clouds.

CO2: Understand the Virtual Machine Provisioning and Migration Services in cloud

CO3: Understand the Aneka Cloud Architecture and Hybrid Cloud Architecture.

CO4: Analyse the Cloud Computing Services provided by Google, Amazon, Microsoft, Sales force and IBM.

CO5: Understand the Cloud Applications, Best Practices and Future of Cloud.

UNIT– I

Introduction to Cloud Computing: Roots of Cloud Computing, Layers and Types of Clouds, Features of a Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Opportunities.

UNIT– II

Virtual Machine Provisioning and Migration Services: Introduction and Inspiration, Virtual Machines (VM), VM Provisioning and Manageability, VM Migration Services, VM Provisioning in the Cloud Context, and Future Research Directions.

UNIT– III

Aneka-Integration of Private and Public Clouds: Introduction, Aneka Cloud Architecture, Aneka Resource Provisioning Service, Aneka Hybrid Cloud Architecture and Implementation steps.

UNIT– IV

Cloud computing with Titans: Google: Google App Engine, Google Web ToolKit. Microsoft: Azure services platform, windows live, Exchange online, sharepoint services, Microsoft Dynamic CRM. Amazon: Amazon EC2, Amazon simpleDB, Amazon S3,Amazon front cloud, Amazon SQS, Amazon Book store, Salesforce.com: force.com, CRM, App Exchange, IBM: services, movements to cloud, security

UNIT– V

Cloud Applications, Best Practices and Future of Cloud: GrepTheWeb on Amazon cloud, ECG. Analyze your service, Best Practices, How cloud computing might Evolve in Future.

Text Books :

1. "Cloud Computing: Principles and Paradigms" by Rajkumar Buyya, James Broberg, and Andrzej Goscinski, Wiley Press, New York, USA, 2011.
2. "Cloud Computing: A Practical Approach" by Anthony T.Velte, Toby J Velte, Robert Elsenpeter. McGraw-Hill, Inc. New York, NY, USA, 2010

Reference Books :

1. "Architecting the Cloud: Design Decisions for Cloud Computing Service Models" by Michael J. Kavis, Wiley Press, 2014
2. "Enterprise Cloud Computing Technology Architecture Applications" by Gautam Shroff, Cambridge University Press, 2010.
3. "Cloud Computing Strategies" by Dimitris N. Chorafas, CRC Press ,2010.

Question Paper Pattern:

Sessional Exam:

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SOFTWARE QUALITY AND TESTING (SQT)

VII Semester: B.Tech-CSE					Scheme: 2017			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	Continuous Internal Assessment	End Exam	TOTAL
CS416	Open Elective-4	3	0	0	3	40	60	100
Sessional Exam Duration:2 Hrs					End Exam Duration:3 Hrs			

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

CO1: Understand the basic concepts of software testing

CO2: Classify the types of software testing to point out the importance of testing in achieving high-quality software

CO3: Use the various testing techniques of a software system

CO4: Compare the traditional software testing and web based testing

CO5: Extend the Quality concepts and Metrics for the Software Quality

UNIT– I

Introduction to Software Testing:

Introduction, Evolution of Software Testing, Software Testing—Myths and Facts, Goals of Software Testing, Psychology for Software Testing, Software Testing Definitions, Model for Software Testing, Effective Software Testing vs. Exhaustive Software Testing, Effective Testing is Hard, Software Testing as a Process, Software Failure Case Studies.

UNIT– II

Software Testing Terminology and Methodology:

Software Testing Terminology, Software Testing Life Cycle (STLC), Software Testing Methodology.

Verification and Validation: Verification and Validation (V&V) Activities, Verification, Verification of Requirements, Verification of High-level Design, Verification of Low-level Design, How to Verify Code? Validation.

UNIT– III

Testing Techniques:

Dynamic Testing: Black-Box Testing Techniques Boundary Value Analysis (BVA), Equivalence Class Testing, State Table-Based Testing, Decision Table-Based Testing, Cause-Effect Graphing Based Testing, Error Guessing.

White-Box Testing Techniques Need of White-Box Testing, Logic Coverage Criteria, Basis Path Testing, Graph Matrices, Loop Testing.

UNIT– IV

Testing Web-based Systems:

Web-based System, Web Technology Evolution, Traditional Software and Web-based Software, Challenges in Testing for Web-based Software, Quality Aspects, Web Engineering (Webe), Testing of Web-based Systems.

UNIT– V

Software Quality Management:

Software Quality, Broadening the Concept of Quality, Quality Cost, Benefits of Investment on Quality, Quality Control and Quality Assurance, Quality Management (QM), QM and Project Management, Quality Factors, Methods of Quality Management, Software Quality Metrics, SQA Models.

Text Books :

1. Software Testing Principles and Practices, Chauhan, Oxford University Press
2. Software Testing, Yogesh Singh, University Press.

Reference Books :

1. Software Testing and Quality Assurance, Theory and Practice A JOHNWILEY & SONS, INC., PUBLICATION by *KSHIRASAGAR NAIK*
2. Fundamentals of Software Testing, AB Mathur, Pearson

Question Paper Pattern:

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Note:

1. Selenium is the latest testing tool can be used to demonstrate the Web Based System in UNIT-4.
2. For UNIT-3 we have problems to solve and assignment questions