



TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated by JNTUH,
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Revised BoS for MBA.
for R22 & 23

The Department of Business Administration (MBA), TKRCET, conducted Board of Studies (BoS) meeting on 15-10-2022 at TKRCET, Hyderabad.

Minutes of the BOS meeting:

The following points have been approved by the BOS members and this will be adopted for the MBA students admitted from the year 2022.

1. Course structure and syllabus for Master of Business Administration Program (MBA), TKRCET, will be followed as it is of JNTUH R-22 MBA course structure and syllabus.
2. The Academic Regulations – R22 of MBA, TKRCET will also be followed as it is as per JNTUH R-22 Academic Regulations.

BOS MEMBERS

1. Dr A.Prabhu kumar, JNTUH Nominee, JNTUH, Hyderabad
2. Dr M Ramesh Kumar, Subject Expert from Mahatma Gandhi University, Nalgonda.
3. Dr P. R.Prasanna Rekha, Subject Expert from Andhra Yuvathi Mandali, Hyd.
4. B.Srinivas Rao, Industrialist, Area Head, Aditya Birla Money Ltd, Hyd
5. Dr B.Renuka , BoS Chaorman. HOD, MBA Department,TKRCET
6. Dr.K.Gyaneshwari , Assistant Professor,TKRCET
7. A.Balakrishna , Assistant Professor , TKRCET
8. T.Rakesh Assistant Professor ,TKRCET
9. A.Chaithanya Assistant Professor, TKRCET
10. L.Chaithanya Assistant Professor,TKRCET

Principal
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Medbowli, Meerpet, Hyderabad-507 007

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Sponsored by TKR Educational Society, Approved by AICTE, New Delhi & Affiliated to JNTU, Hyderabad, Accredited by NBA)
Department of MBA

BOS Meeting Held on 15-10-2022

Board of studies of every department shall be constitute as per the UGC guidelines

S. No	Category	Name	Position (Status)	Designation in BOS	Subject Specialization	Signature
1	Head of the Department concerned.	Dr.B.Renaka	Assistant Professor	Chairperson	Finance	
2	One expert to be nominated by the vice-chancellor from a panel of six recommended by the college principal.	Dr A.Prabhu Kumar	Director, I/c, School of Management Studies, JNTUH Assistant Professor, Controller of Examinations, Mahatma Gandhi University	Member		
3	Two experts in the subject from outside the college to be nominated by Academic council.	Dr M.Ramesh Kumar	Professor, Vidya Dnyani College of Management	Member	Behavioral Science, Marketing	
5	One representative from industry/Corporate sector/allied area relating to placement.	Dr P.R.Prasanna Rekha	Area Head, Aditya Birla Money Ltd.	Member	Human Resource (HR)	
2	Experts of each specialization.	B. Srinivas Rao L.Chaitanya, K.Gyanseshwari, A.Chaitanya, A.Bala Krishna	Assistant Professor	Member	Finance Marketing HR Entrepreneurship	
6	One postgraduate meritorious alumnus to be nominated by the principal.	V. Suslantha(18K91E0005)	Student	Member	Finance	
7	The Chairman, Board of Studies, may with the approval of the principal of the college, co-opt a) Experts from outside the college whenever special courses of studies are to be formulated.	T. Rakesh	Assistant Professor	Member	Finance	


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TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

MASTER OF BUSINESS ADMINISTRATION (Regular) R-22
Effective from Academic Year 2022 - 23 Admitted Batch
COURSE STRUCTURE AND SYLLABUS

I Year I Semester

Course Code	Course Title	L	T	P	Credits
22MBA01	Management and Organizational Behaviour	4	0	0	4
22MBA02	Business Economics	4	0	0	4
22MBA03	Financial Reporting & Analysis	4	0	0	4
22MBA04	Research Methodology and Statistical Analysis	4	0	0	4
22MBA05	Legal and Business Environment	4	0	0	4
Open Elective- 122MBA06	6A Business Ethics and Corporate Governance 6B Project Management 6C Sustainability Management 6D Cross Cultural Management	3	0	0	3
22MBA07	Business Communication Lab.	0	0	2	2
22MBA08	Statistical Data Analysis Lab	0	0	2	2
	TOTAL	23	0	4	27

I Year II Semester

Course Code	Course Title	L	T	P	Credits
22MBA09	Human Resource Management	4	0	0	4
22MBA10	Marketing Management	4	0	0	4
22MBA11	Financial Management	4	0	0	4
22MBA12	Quantitative Analysis for Business Decisions	4	0	0	4
22MBA13	Entrepreneurship and Design Thinking	4	0	0	4
22MBA14	Logistics & Supply Chain Management	4	0	0	4
Open Elective-II 22MBA15	15A Total Quality Management 15B Marketing Research 15C International Business 15D Rural Marketing	3	0	0	3
	TOTAL	27	0	0	27

Internship during summer vacation (after Semester -II)

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1. Dr A.Prabhu kumar, JNTUH Nominee, JNTUH, Hyderabad <i>A. Prabhu Kumar</i>	2. Dr M Ramesh Kumar, Subject Expert -1 <i>M. Ramesh Kumar</i>	3. Dr P. R. Prasanna Rekha, Subject Expert -2 <i>P. R. Prasanna Rekha</i>
4. B. Srinivas Rao, Industrialist <i>B. Srinivas Rao</i>	5. Dr B. Renuka, BOS Chairman, MBA, TKRCET <i>B. Renuka</i>	6. Dr. K. Gyaneshwari, Internal Subject Expert - 1 <i>K. Gyaneshwari</i>
7. A. Chaithanya, Internal Subject Expert - 2 <i>A. Chaithanya</i>	8. L. Chaithanya, Internal Subject Expert - 3 <i>L. Chaithanya</i>	9. A. Balakrishna (Faculty) 10. T. Rakesh (Faculty) <i>A. Balakrishna</i> <i>T. Rakesh</i>


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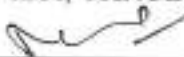

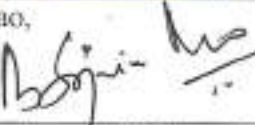
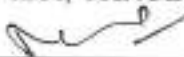


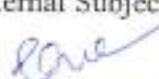
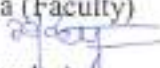

II Year I Semester (III Semester)

Course Code	Course Title	L	T	P	Credits
22MBA16	Production & Operations Management	4	0	0	4
22MBA17	Management Information Systems	4	0	0	4
22MBA18	Business Analytics	4	0	0	4
22MBA19 M1/H1/F1/E1	(MRKG/HRM/FIN/ENTP)	4	0	0	4 -
22MBA20 M2/H2/F2/E2	(MRKG/HRM/FIN/ENTP)	4	0	0	4
22MBA21 M3/H3/F3/E3	(MRKG/HRM/FIN/ENTP)	4	0	0	4
22MBA22	Summer Internship	0	0	2	2
	TOTAL	24	0	2	26

II Year II Semester (IV Semester)

Course Code	Course Title	L	T	P	Credits
22MBA 23	Strategic Management	4	0	0	4
22MBA24 M4/H4/F4/E4	(MRKG/HRM/FIN/ENTP)	4	0	0	4
22MBA25 M5/H5/F5/E5	(MRKG/HRM/FIN/ENTP)	4	0	0	4
22MBA26 M6/H6/F6/E6	(MRKG/HRM/FIN/ENTP)	4	0	0	4
22MBA27	Pre-submission project Seminar	0	0	2	2
22MBA28	Main Project Viva-Voce	0	0	4	4
	TOTAL	16	0	6	22

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LIST OF ELECTIVE SUBJECTS:

Students have to select any One Specialization (Marketing, Finance, Human Resources, and Entrepreneurship) and he/she needs to select the Core Elective subjects listed under the chosen specialization only.

Course Code	Specialization	Credits
MARKETING		
22MBA19M1	DigitalMarketing	4
22MBA20M2	SalesandPromotionManagement	4
22MBA21M3	ConsumerBehaviour	4
22MBA24M4	International Marketing	4
22MBA25M5	ServicesMarketing	4
22MBA26M6	MarketingAnalytics	4
FINANCE		
22MBA19F1	Security AnalysisandPortfolioManagement	4
22MBA20F2	RiskManagementandFinancialDerivatives	4
22MBA21F3	StrategicCost andManagement Accounting	4
22MBA24F4	InternationalFinancialManagement	4
22MBA25F5	StrategicFinancialManagement	4
22MBA26F6	FinancialAnalytics	4
HUMANRESOURCES		
22MBA19H1	Talentand PerformanceManagementSystems	4
22MBA20 H2	LearningandDevelopment	4
22MBA21 H3	EmployeeRelations	4
22MBA24 H4	InternationalHumanResourceManagement	4
22MBA25H5	LeadershipandChangeManagement	4
22MBA26 H6	HRAalytics	4
ENTREPRENEURSHIP		
22MBA19E1	Start-up and MSMEManagement	4
22MBA20E2	TechnologyBusinessIncubation	4
22MBA21E3	InnovationandEntrepreneurship	4
22MBA24E4	EntrepreneurialFinance	4
22MBA25E5	EntrepreneurialMarketing	4
22MBA26E6	FamilyBusinessManagement	4

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		10. T. Rakesh (Faculty) <i>T. Rakesh</i>

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COMPUTER SCIENCE&ENGINEERING (DATA SCIENCE)

B.Tech I Year I Semester

L/T/P/C
3/0/0/3

C PROGRAMMING FOR PROBLEM SOLVING (DIESCP1)

Course Objective:

Learn the fundamentals of computers and C Programming concepts.

Course Outcomes:

After learning the contents of this course, the student must be able to

1. Learn the taxonomy of computers and C fundamentals
2. Demonstrate arrays and functions to write c programming
3. Write C programs using pointers and strings
4. Analyze and write C programs using structures and unions
5. Develop C programs for various applications using file I/O functions.

UNIT I

Introduction to Computers Data Representation

Number Systems, Computer Languages, Algorithms. Introduction to C Language: Data types, Operators, Expressions, Statements-Selection Statements – if and Switch Statements, Repetition (Loop) statements.

UNIT II

Arrays

One and two dimensional arrays, multidimensional arrays, inter function communication Arrays applications- linear search, binary search, bubble sort, Implementation of stacks and queues.

Functions: Scope and Extent, storage classes, recursive functions.

UNIT III

Pointers

Introduction, Pointers for inter function communication, arrays of pointers, pointer arithmetic and arrays, passing an array to a function, memory allocation functions, pointers to functions, pointers to pointers.

Strings: Concepts, String Input/ Output functions, arrays of strings, string manipulation functions.

Vasanth

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UNIT IV**User Defined Data types Structure and Unions**

Initialization, accessing structures, operations on structures. Complex structures-Nested structures, structures containing arrays, structures containing pointers, arrays of structures, structures and functions, Passing structures through pointers, self-referential structures, unions, bit fields, C programming examples, command-line arguments, pre-processor commands.

UNIT V**Input and Output**

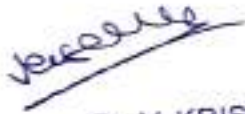
Concept of a file, streams, text files and binary files, file input/output functions (standard library input/output functions for files), error handling, positioning functions (fseek, rewind and ftell).

Text Books:

1. Computer Science: A Structured Programming Approach Using C, B. A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh, Second Edition, Oxford University Press.

Reference Books:

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearson education.
2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw Hill Education (India) Pvt Ltd.
3. C From Theory to Practice, G S. Tselikis and N D. Tselikas, CRC Press.
4. Basic computation and Programming with C, Subrata Saha and S. Mukherjee, Cambridge University Press.


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COMPUTER SCIENCE&ENGINEERING (DATA SCIENCE)

B.Tech I Year I Semester

L/T/P/C

0/0/2/1

IT WORKSHOP (D1ESITW1)

Course

Objectives:

Training on PC Hardware, assembling, software installation, Internet, World Wide Web, and usage of productivity tools for documentation, Spreadsheet computations and Presentations.

Course Outcomes:

After learning the contents of this course, the student will be able to

1. Apply knowledge for computer assembling and software installation.
2. Solve the trouble shooting problems.
3. Apply the tools for preparation of PPT, Documentation and budget sheet
4. Create standard documents and research documents using Latex.
5. Create project plans.

PC Hardware

The students should work on working PC to disassemble and assemble to working condition and install operating system like Linux or any other on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Problem 1

Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

Problem 2

Every student should individually install operating system like Linux or MS windows on the personal computer. The system should be configured as dual boot with both windows and Linux.

Problem 3

Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

Problem 4

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

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Internet & World Wide Web

Problem 5

Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate how to access the websites and email.

Problem 6

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Problem 7

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. Usage of search engines like Google, Yahoo, ask.com and others should be demonstrated by student.

Problem 8

Cyber Hygiene: Students should learn about viruses on the internet and install antivirus software. Student should learn to customize the browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Problem 9

Develop home page: Student should learn to develop his/her home page using HTML consisting of his/her photo, name, address and education details as a table and his/her skill set as a list.

Productivity Tools LaTeX and Word Word Orientation

An overview of LaTeX and Microsoft (MS) office / equivalent (FOSS) tool word should be learned: Importance of LaTeX and MS office / equivalent (FOSS) tool Word as word Processors, Details of the three tasks and features that should be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Problem 10

Using LaTeX and Word

To create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colours, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Problem 11

Creating project abstract Features to be covered

Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Problem 12

Creating a Newsletter Features to be covered

Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs in word.

Problem 13

Spreadsheet Orientation

Accessing, overview of toolbars, saving spreadsheet files, Using help and resources.

Creating a Scheduler

Gridlines, Format Cells, Summation, auto fill, Formatting Text.

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Problem 14**Calculating GPA Features to be covered**

Cell Referencing, Formulae in spreadsheet – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, Sorting, Conditional formatting.

Problem 15**Creating Power Point**

Student should work on basic power point utilities and tools in Latex and Ms Office/equivalent (FOSS) which help them create basic power point presentation, PPT Orientation, Slide Layouts, Inserting Text, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting Images, Tables and Charts.

Text Books:

1. Introduction to Information Technology, IITL Education Solutions limited, Pearson Education.
2. LaTeX Companion – Leslie Lamport, PHI/Pearson.
3. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
4. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
5. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft).

SCI LAB

1. a) Introduction to Sci lab and its benefits
b) Sci Lab migration, Toolboxes and Forums
2. a) Installing
b) Getting Started
3. a) Vector Operation
b) Matrix Operation
4. a) Conditional branching
b) Iteration
5. Scripts and Functions
6. Plotting 2D graphs
7. File Handling
8. User Defined Input and Output
9. Integration
10. Solving Non linear Equations
11. a) Linear equations Gaussian Methods
b) Linear equations Iterative Methods
12. Interpolation
13. a) ODE Euler methods
b) ODE Applications
c) Optimization Using Karmakar Function
14. Digital Signal Processing
15. a) Control systems
b) Discrete systems
16. a) Xcos Introduction
b) Calling User Defined Functions in XCOS
c) Simulating a PID controller using XCOS

Vesolu

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COMPUTER SCIENCE & ENGINEERING (DATA SCIENCE)

SEMESTER IV

L/T/P/C
3/0/0/3

DATABASE MANAGEMENT SYSTEMS (D84PC6)

Course Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Course Outcomes:

Upon completion of the course the student will be able to:

- | | |
|---|----|
| 1. Apply database management principles in designing relational databases. | L3 |
| 2. Construct ER diagram to design databases to perform operations using Relational Algebra & calculus | L3 |
| 3. Apply normalization techniques on a database constructed by using SQL | L3 |
| 4. Implement transaction processing and concurrency control techniques for a given database. | L3 |
| 5. Apply indexing techniques to perform data manipulation tasks for a given database | L3 |

UNIT - I

Database System Applications: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS

Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model

UNIT - II

Introduction to the Relational Model: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views. Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT - III

SQL: QUERIES, CONSTRAINTS, TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active databases.

Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, First, Second, Third normal forms, BCNF, lossless join decomposition, multivalued dependencies, Fourth normal form, Fifth normal form.

UNIT - IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, LockBased Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log-Based Recovery, Recovery with Concurrent Transactions.


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UNIT - V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree based Indexing, Comparison of File Organizations, Indexes- Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, McGraw hill, V edition.3rd Edition
2. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education
3. Introduction to Database Systems, C. J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.



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**CSE (DATA SCIENCE)
MACHINE LEARNING – C85PC2**

B.Tech. V Semester

L/T/P/C

3/0/0/3

COURSE OBJECTIVES:

To be able to formulate machine learning problems corresponding to different applications and range of machine learning algorithms along with their strengths and weaknesses

COURSE OUTCOMES:

After completion of this course, the student will be able to

1. Understand the basic concepts such as decision trees and neural networks.
2. Develop the ability to formulate machine learning techniques to respective problems.
3. Apply machine learning algorithms to solve problems of moderate complexity.

UNIT-I:

Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning

Concept Learning And The General To Specific Ordering – Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias

UNIT-II:

Decision Tree Learning – Introduction, Decision tree representation, appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning

Artificial Neural Networks – Introduction, Neural network representation, appropriate problems for neural network learning, Perceptron, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition Advanced topics in artificial neural networks

Evaluation Hypotheses – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms

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**UNIT-III:**

Bayesian Learning – Overview of Bayes theorem principle, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibbs algorithm, Naïve Bayes classifier.

Computational Learning Theory – Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space.

Instance-Based Learning - Introduction, k -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning.

UNIT-IV:

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL.

Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation- Based Learning, Explanation-Based Learning-Discovery new features.

UNIT V:

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical approaches to Learning.

Reinforcement Learning and Q Learning.

TEXT BOOKS:

1. Machine Learning – Tom M. Mitchell, -MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis(CRC)

REFERENCE BOOKS:

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, WilliamW Hsieh, Cambridge Univ Press.
2. Richard o.Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley& Sons Inc.,2001
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press,1995

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B.Tech III Semester

CSE (DATA SCIENCE)

L/T/P/C
3 /0/ 0/ 3**R PROGRAMMING (C83PC3)****Course Objectives:**

Gain knowledge on statistical data manipulation and analysis.

Course Outcomes:

After completion of this course, the students will be able to

1. Understand the basic functions of R and Create vectors in R.
2. Gain knowledge on creation of matrices and arrays in R.
3. Gain knowledge on creation of Factors and Data frames in R.
4. Understand and implement the searching and sorting techniques in R. and the file concepts in R.
5. Automate analyses and create new functions that extend the existing language features. Incorporates features found in object-oriented and functional programming languages.

UNIT I**Introduction to R**

Introduction, Functions, Preview of Some Important R Data Structures, Regression Analysis of Exam Grades, Startup and Shutdown, Getting Help, The help() Function, The example() Function. Vectors, Scalars, Vectors, Arrays, and Matrices, Declarations, Common Vector Operations, Using all() and any(), Vectorized Operations, NA and NULL Values, Filtering, Vectorized if-then-else.

UNIT II**Matrices and Arrays**

Creating Matrices, General Matrix Operations, Applying Functions to Matrix Rows and Columns, More on the Vector/Matrix Distinction, Avoiding Unintended Dimension Reduction, Naming Matrix Rows and Columns, Higher-Dimensional Arrays.

Lists: Creating Lists, General List Operations, Accessing List Components and Values Applying Functions to Lists, Recursive Lists.

UNIT III**Data Frames**

Creating Data Frames, Other Matrix-Like Operations, Merging Data Frames, Applying Functions to Data Frames.

Factors and Tables: Factors and Levels, Common Functions Used with Factors, Working with Tables, Other Factor-and Table-Related Functions.

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R PROGRAMMING (C83PC3)**UNIT IV****R Programming Structures**

Control Statements, Arithmetic and Boolean Operators and Values, Default Values for Arguments, Return values, Functions Are Objects, Environment and Scope Issues, No Pointers in R, Writing Upstairs, Recursion, Replacement Functions, Anonymous Functions.

Math and Simulations in R: Math Functions, Functions for Statistical, Sorting, Set Operations.

UNIT V**Files**

Accessing the Keyboard and Monitor, Reading and Writing Files, Accessing the Internet.

String Manipulation: String-Manipulation Functions.

Graphics: Creating Graphs, Customizing Graphs.

Text Books:

1. The Art of R Programming by Norman Matloff-No Starch Press.

Reference Books:

1. R Programming for Bioinformatics by Robert Gentleman—CRC Press.
2. Data Analytics using R by Seema Acharya-TMH.
3. Hands-On Programming with R by Grrett Grolemond-OREILLY.
4. Beginners guide for Data Analytics using R by Jeeva Jose-Khanna Publications.
5. R for Beginners by Sandip Bakshit-TMH.



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CSE (DS)



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CSE (DATA SCIENCE)

**L/T/P/C
3 /0/ 0/ 3**

B.Tech IV Semester

DATA VISUALIZATION (C84PC4)

Course Objectives:

To understand the visual representation of structured and un structured data.

Course Outcomes:

After completion of course, the students will be able to

1. Understand the visualization and Data basics
2. Understand the Visualization process and know the representation of Spatial & Geo spatial data
3. Analyze various Visualization techniques for Multivariate data and other structures of data
4. Interacting the different operators and different data spaces
5. Design effective visualization of modern toolkits

UNIT I

Introduction

What is Visualization, History, Relationship visualization with other fields, The visualization Process, Pseudocode Conventions, The Scatter plot

Data Foundations: Types of Data, Structure within and between the records, Data Processing.

UNIT II

Visualization Foundations

The Visual Process, Semiology of Graphical Symbols, The Eight Visual Variables, Historical Perspective, Taxonomies.

Visualization Techniques for Spatial Data: One-Dimensional Data, Two-Dimensional Data, Three-Dimensional Data, Dynamic Data, Combining Techniques.

Visualization Techniques for Geospatial Data: Visualizing Spatial Data, Visualization of Point Data, Visualization of Line Data, Visualization of Area Data.

UNIT III

Visualization Techniques for Multivariate Data

Point-Based Techniques, Line-Based Techniques, Region-Based Techniques, Combinations of Techniques, Visualization Techniques for Trees, Graphs, and Networks: Displaying Hierarchical Structures, Displaying Arbitrary Graphs/Networks.

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DATA VISUALIZATION (C84PC4)**UNIT IV****Text and Document Visualization**

Levels of Text Representation, The Vector Space Model, Single Document Visualizations, Document Collection Visualizations.

Interaction Concepts: Interaction Operators, Interaction Operands and Spaces, A Unified Framework.

Interaction Techniques: Object Space, Data Space, Attribute Space, Data Structure Space, Visualization Structure Space, Animating Transformations, Interaction Control.

UNIT V**Designing Effective Visualizations**

Steps in Designing Visualizations, Problems in Designing Effective Visualizations

Comparing and Evaluating Visualization Techniques: User Tasks, User Characteristics, Data Characteristics, Visualization Characteristics, Structures for Evaluating Visualizations.

Visualization Systems: Systems Based on Data Type, Systems Based on Analysis Type, Text Analysis and Visualization, Modern Integrated Visualization Systems, Toolkits

Text Books:

1. Interactive Data Visualization Foundations, Techniques, and Applications by Grinstein, Georges Keim, Daniel Ward, Matthew O , CRC Press Taylor & Francis Group.
2. Digital Image. Processing. Third Edition. Rafael C. Gonzalez. University of Tennessee. Richard E. Woods. NledData Interactive. Pearson International Edition.

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COMPUTER SCIENCE & ENGINEERING (DATA SCIENCE)

B.Tech. III SEMESTER.

L/T/P/C

2/0/0/2

PYTHON PROGRAMMING (D3ESPP2)

Course Objective:

To understand and learn the concepts of basic python programming, as it is a current programming constructs used for real time applications.

Course Outcomes:

After completion of course the student will be able to

1. Understand the basic concepts of python programming
2. Illustrate operators, conditional statements, loops in python
3. Construct code and test small python programs using functions and data structures
4. Develop different programs using file concept modules of python
5. Apply the concepts of object - oriented programming in python

UNIT I

INTRODUCTION

Introduction to Python, History, Need of Python Programming, features Applications, python environment setup, Basic syntax, Variables, Data Types, Keywords, Input-Output, Indentation, script structure, Running Python Scripts.

UNIT II

OPERATORS

Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations, Conditional statements if, if-else Looping Control Structures for, while Control Statements: Break, Continue, Pass.

UNIT III

FUNCTIONS

Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.


DATA STRUCTURES

Lists, Tuples, dictionaries, sets, Sequences, Comprehensions.

UNIT IV

FILES

File input/output, Text processing file functions.


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CSE (DS)

MODULES

Creating modules, import statement, from. Name spacing, Packages, using packages, implementing packages: numpy, pandas, Django framework, iterator tools, scipy, matplotlib lib.

UNIT V

Object Oriented Programming in Python Classes, 'self-variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exception Handling


Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

Text Books:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
2. Wesley J. Chun "Core Python Programming", Second Edition, Prentice Hall.

Reference Books:

1. Allen Downey, "Think Python", Second Edition, Green Tea Press.
2. Introduction to Computation & Programming Using Python, Spring 203 Edition, By John V.Guttag.
Programming in Python
- 3: A Complete Introduction to the Python Language (Developer's Library), by Mark Summerfield, 2ndEdition


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CSE (DATA SCIENCE)
NATURAL LANGUAGE PROCESSING - C86PC1
B.Tech. VI Semester
**L/T/P/C
3 /1/ 0/ 4**
COURSE OBJECTIVE:

Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.

COURSE OUTCOMES:

After completion of this course, the student will be able to

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
3. Able to design, implement, and analyze NLP algorithms.
4. Able to design different language modeling Techniques.

UNIT – I:

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models
Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

UNIT – II:

Syntax Analysis: Parsing Natural Language, Tree banks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues.

UNIT – III:

Semantic Parsing: Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

UNIT – IV:

Predicate Argument Structure: Resources, System, Softwares, Meaning Representation: Resources, System, Software.

UNIT – V:

Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Cross lingual Language Modeling.

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**TEXT BOOKS:**

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication.

REFERENCE BOOKS:

1. Speech and Natural Language Processing – Daniel Jurafsky & James H Martin, Pearson Publications.

A handwritten signature in black ink, appearing to read 'V. Krishna'.

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COMPUTERSCIENCE&ENGINEERING (DATASCIENCE)

B.Tech. III SEMESTER.

L/T/P/C

3/0/0/3

INTRODUCTION TO DATA SCIENCE (D83PC1)

Course Objectives

1. Enable You to Analyze of Data Using R
2. Learn Techniques and Tools for Transformation of Data
3. Familiarize You with Different Formats
4. Learn Data Visualization and Optimization

Course Outcomes

After completion of the course student can able to

1. Understand the basic concept of Data Science
2. Use Data Visualization techniques
3. Know the importance of Linear Regression
4. Understand the R programming basics
5. Use the data structures in R programming

UNIT - I

What is Data Science: Computer Science, Data Science, and Real Science, Asking Interesting Questions from Data, Properties of Data, Classification and Regression, Data Science Television: The Quant Shop. Scores and Rankings: The Body Mass Index (BMI), Developing Scoring Systems, Z-scores and Normalization, Advanced Ranking Techniques,

UNIT - II

Visualizing Data: Exploratory Data Analysis, Developing a Visualization Aesthetic, Chart Types, Great Visualizations, Reading Graphs, Interactive Visualization. Mathematical Models: Philosophies of Modeling, A Taxonomy of Models, Baseline Models, Evaluating Models, Evaluation Environments

UNIT - III

Linear and Logistic Regression: Linear Regression, Better Regression Models, Regression as Parameter Fitting Distance and Network Methods: Measuring Distances, Nearest Neighbor Classification, Graphs, Networks, and Distances, PageRank, Clustering

UNIT - IV

Introduction, Functions, Preview of Some Important R Data Structures, Regression Analysis of Exam Grades, Startup and Shutdown, Getting Help, The help() Function, The example() Function. Vectors

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Scalars, Vectors, Arrays, and Matrices, Declarations, Common Vector Operations, Using all() and any(), Vectorized Operations, NA and NULL Values, Filtering, Vectorized if-then-else

UNIT - V

MATRICES AND ARRAYS, LISTS, DATA FRAMES, FACTORS AND TABLES.

TEXT BOOKS & REFERENCE BOOKS:

1. The Data Science Design MANUAL ,Steven S. Skiena , Springer
2. The Art of R Programming by Norman Matloff-No Starch Press


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COMPUTER SCIENCE & ENGINEERING (DATASCIENCE)

B.Tech. III SEMESTER.

L/T/P/C

3/0/0/3

COMPUTER ORGANIZATION & OPERATING SYSTEMS (D83PC2)

Course Objectives:

1. To understand the structure of a computer and its operations.
2. Understanding the concepts of I/O and memory organization and operating systems

Course Outcomes:

1. Understand the Basic Structure of Computers, Register Transfer Language and Micro Operations
2. Design the hardwired and micro-programmed control units.
3. Analyze I/O data transfer modes and memory hierarchy
4. Understand the basic concepts of operating system, CPU scheduling and deadlocks.
5. Understand the memory management and file system.

UNIT - I:

Basic Structure of Computers: Computer Types, Functional UNIT, Basic Operational Concepts, Bus, Structures, Software, Performance, Multiprocessors and Multi Computers, Data Representation, Fixed Point Representation, Floating - Point Representation.

Register Transfer Language and Micro Operations: Register Transfer Language, Register Transfer Bus and Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit, Instruction Codes, Computer Registers Computer Instructions - Instruction Cycle. Memory - Reference Instructions, Input - Output and Interrupt, Instruction Formats, Addressing Modes,

UNIT - II:

Micro Programmed Control: Control Memory, Address Sequencing, Micro program Examples, Design of Control Unit, Hard Wired Control, Micro programmed Control. The Memory System: Basic Concepts of Semiconductor RAM Memories, Read-Only Memories, Cache Memories Performance Considerations, Virtual Memories secondary Storage, Introduction to RAID.

UNIT - III:

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer Modes, Priority Interrupt, Direct Memory Access, Input-Output Processor (IOP), Serial Communication; Introduction to Peripheral Components, Interconnect (PCI) Bus, Introduction to Standard Serial Communication Protocols like RS232, USB, IEEE1394.

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UNIT - IV:

Operating Systems Overview: Overview of Computer Operating Systems Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating Systems Structures Operating System Services and Systems Calls, System Programs, Operating System Generation.

CPU Scheduling: Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling, System call interface for process management-fork, exit, wait, waitpid, exec,

Deadlock :System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock.

UNIT - V:

Memory Management: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Allocation of Frames, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization,

File System Interface: The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection. File System Implementation: File System Structure, File system Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

TEXT BOOKS:

1. Computer Organization - Carl Hamacher, ZvonksVranesic, SafeaZaky, 5th Edition, McGraw Hill.
2. Computer System Architecture - M. moris mano, 3rd edition, Pearson
3. Operating System Concepts - AbrehamSilberchatz, Peter B. Galvin, Greg Gagne, 8th Edition, John Wiley.

REFERENCE BOOKS:

1. Computer Organization and Architecture - William Stallings 6th Edition, Pearson
2. Structured Computer Organization - Andrew S. Tanenbaum, 4th Edition, PHI



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COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

B.Tech. III SEMESTER.

L/T/P/C

3/0/0/3

COMPUTER NETWORKS (D83PC3)

Course Objective:

Identify the components required to build different types of networks and choose the required functionality at each layer for a given application

Course Outcomes:

Upon completion of the course the student will be able to

1. Understand the protocol layering and physical level communication
2. Analyze Data link layer and MAC layer
3. Compare and contrast between the functions of the network layer and the various routing protocols
4. Demonstrate the functions and protocols of the Transport layer
5. Illustrate the functions and protocols of the Application layer

UNIT I

Introduction: OSI, TCP/IP, and other network models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN. **Physical Layer:** Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications; Narrowband, broadband ISDN and ATM.

UNIT II

Data link layer: Design issues, framing, error detection and correction, CRC, Elementary Protocol stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM. Medium Access sub layer: ALOHA, MAC addresses, Carrier sense multiple access. IEEE 80.X Standard Ethernet, wireless LANs. Bridges.

UNIT III

Network Layer: Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing. Dynamic routing – Broadcast routing. Rotary for mobility, The Network layer on the internet and in the ATM Networks.

UNIT IV

Transport Layer: Transport Services, Connection management, TCP and UDP protocols; Congestion Control Algorithms – General Principles – of Congestion prevention policies ATM AAL Layer Protocol.

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UNIT V

Application Layer – Domain name system, SNMP, Electronic Mail (SMTP, POP3, IMAP, MIME) the World WEB, HTTP.

Text Books:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI.

Reference Books:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson.
3. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH



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COMPUTER SCIENCE & ENGINEERING (DATASCIENCE)

B.Tech. III SEMESTER

L/T/P/C
0/0/2/1

PYTHON & RPROGRAMMING LAB (D3ESPP7)

Course Objectives:

- To install and run the Python interpreter using control structures, Lists, Dictionaries, Strings and Files
- Effective use of Business Intelligence(BI) technology (Tableau) to apply data visualization

Course Outcomes:

At the end of the course a student should be able to

- Develop the application specific codes using python.
- Understand Strings, Lists, Tuples and Dictionaries in Python
- Develop Programs and understand how to map Visual Layouts and Graphical Properties.
- Create a Dashboard that links multiple visualizations.
- Use graphical user interfaces to create Frames for providing solutions to real world problems.

Python Programming

Week-1:


- Use a web browser to go to the Python website <http://python.org>. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
 - Start the Python interpreter and type `help()` to start the online help utility.
- Start a Python interpreter and use it as a Calculator.

Week-2:

- Print the below triangle using for loop. 5

```
4 4
3 33
2 222
1 1111
```

- Write a program to check whether the given input is digit or lower case character or upper case character or a special character (use 'if-else-if ladder')


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Week-3:

- 1 i) Write a program to convert a list and tuple into arrays. ii) Write a program to find common values between two arrays.
- 2 Write a function called `gcd` that takes parameters and hand returns their greatest common divisor

Week-4:

1. Write a function called `is_sorted` that takes a list as a parameter and returns True if the list is sorted in ascending order and False otherwise.
2. Writes a recursive function that generates all binary strings of n-bit length

Week-5:

1. Write a python program that defines a matrix and prints
2. Use the structure of exception handling all general purpose exceptions.

Week-6:

- 1 Write a function called `draw_rectangle` that takes a Canvas and Rectangle as arguments and draws a representation of the Rectangle on the Canvas
- 2 Write a python code to read a phone number and email-id from the user and validate it for correctness.

Week-7

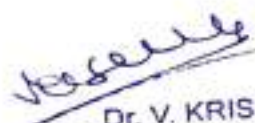
1. Write a Python code to merge two given file contents into a third file.
2. Write a Python code to open a given file and construct a function to check for given words present in it and display on found.

Week-8:

1. Import numpy, Plotpy and Scipy and explore their functionalities.
2. a) Install Num Py package with pip and explore it.

R Programming

- 1 Understanding Data, What is data, where to find data, Foundations for building Data Visualizations, Creating Your First visualization?
- 2 Getting started with Tableau Software using Data file formats, connecting your Data to Tableau, creating basic charts (line, bar charts, Treemaps), Using the Show me panel.
- 3 Tableau Calculations, Over view of SUM, AVG, and Aggregate features, Creating custom calculations and fields.
- 4 Applying new data calculations to your visualizations, Formatting Visualizations, Formatting Tools and Menus, Formatting specific parts of the view.
- 5 Editing and Formatting Axes, Manipulating Data in Tableau data, Pivoting Tableau data.
- 6 Structuring your data, Sorting and filtering Tableau data, Pivoting Tableau data.
- 7 Advanced Visualization Tools: Using Filters, Using the Detail panel, using the Size panels, customizing filters, Using and Customizing tool tips, Formatting your data with colors.
- 8 Creating Dashboards & Storytelling. creating your first dash board and Story, Design for different displays, adding interactivity to your Dashboard, Distributing & Publishing your Visualization.
- 9 Tableau file types, publishing to Tableau Online, Sharing your visualizations, printing, and Exporting.
- 10 Creating custom charts, cyclical data and circular area charts, Dual Axis charts.


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TEXTBOOKS:

1. Super charged Python: Take your code to the next level, Overland
2. Learning Python, MarkLutz, O'reilly

REFERENCEBOOKS:

- Python Programming: A Modern Approach, Vamsi Kurama, Pearson
- Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
- Programming with Python, A User's Book, Michael Dawson, Cengage Learning, India Edition
- R Programming by Norman Think Python, Allen Downey, Green Tea Press
- Core Python Programming, W.Chun, Pearson
- Introduction to Python, Kenneth A. Lambert, Cengage □ Microsoft Power BI cook book, Brett Powell, 2nd edition. □ R Programming for Data Science by Roger D. Peng (References) □ The Art of Matlab Cengage Learning India.



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COMPUTER SCIENCE & ENGINEERING (DATA SCIENCE)

SEMESTER IV

L/T/P/C

3/0/0/3

DATA WAREHOUSING & DATA MINING (D84PC4)

Course Objectives:

To provide students with an understanding of Datawarehouse principles and Data mining concepts.

Course Outcomes:

Upon completion of the course the student will be able to :

- | | |
|---|----|
| 1. Experiment formally with data warehouse and summarizes the architecture and components used for constructing a data warehouse. | L3 |
| 2. Implement the data pre-processing techniques to incorporate the data mining tasks on various kinds of data. | L3 |
| 3. Identify the significance of association rule by understanding the item-set representation. | L3 |
| 4. Classify the data to gain learning experiences using various classification techniques | L4 |
| 5. Categorize the data based on the similarity measures through different clustering algorithms to Estimate the outliers. | L4 |

Unit I

Data Warehouse

Introduction to Data warehouse, Difference between operational database systems and data warehouses. Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction – Transformation – Loading, Logical (Multi – Dimensional), Data Modelling, Schema Design, Star, Snow Flake Schema and Fact Constellation, Fact Table, Fully Addictive, Semi – Addictive, Non-Addictive Measures; Fact Constellation, Fact Table, Fully Addictive, Semi – Addictive, Non-Addictive Measures; Fact – Less – Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture – ROLAP, MOLAP and HOLAP

UNIT II

Introduction to Data Mining

Introduction, What is Data Mining, Definition, KDD, Challenges, Data Mining Tasks, Data Preprocessing, Data Cleaning, Missing data, Dimensionality Reduction, Feature Subset Selection, Discretization and Binarization, Data Transformation; Measures of Similarity and Dissimilarity- Basics.

Unit III


Association Rules

Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIORI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set, Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT IV

Classification

Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test


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conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naïve – Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

UNIT V

Clustering

Problem Definition, Clustering Overview, Evaluation of Clustering Algorithms, Partitioning Clustering- K-Means Algorithm, K-Means Additional issues, PAM Algorithm; Hierarchical Clustering Agglomerative Methods and divisive methods, Basic Agglomerative Hierarchical Clustering Algorithm, Specific techniques, Key Issues in Hierarchical Clustering, Strengths and Weakness; Outlier Detection.

Text Books:

1. Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier 2 Edition, 2006.
2. Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbach, Pearson Education.

Reference Books:

1. Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
2. Data Warehousing Fundamentals, Paulraj Ponnaiah, Wiley Student Edition.
3. The Data Warehousing Life Cycle Toolkit – Ralph Kimbal. Wiley Student Edition.
4. Data Mining, Vikaram Pudi, P Radha Krishna, Oxford University Press.



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CSE (DS)



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R22

COMPUTER SCIENCE & ENGINEERING (DATASCIENCE)

SEMESTER IV

L/T/P/C

2/0/0/2

WEB TECHNOLOGIES (D84PC8)

COURSE OBJECTIVES:

To introduce PHP language for server side scripting and introduce XML and processing of XML Data with Java , Server side programming with Java Servlets and JSP, Client side scripting with Java script and AJAX.

COURSE OUTCOMES:

Upon completion of the course the student will be able to

- | | |
|---|----|
| 1. Understand basics of server side scripting using PHP | L2 |
| 2. Write programs with knowledge of client side scripting , validation of forms and AJAX programs | L4 |
| 3. Illustrate well formed XML programs , use XML data with JAVA Script | L3 |
| 4. Design server side programming applications with servlets | L5 |
| 5. Develop real time applications using JSP | L5 |

Unit – I:

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

Unit – II:

Client-side Scripting: Introduction to Javascript: Javascript language – declaring variables, the scope of variables, functions, event handlers (click, onsubmit etc.), Document Object Model, Form validation. Simple AJAX application.

Unit – III:

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java.

Unit – IV:

Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

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Unit – V:

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

TEXTBOOK:

1. Web Technologies, Uttam K Roy, Oxford University Press.
2. The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill.

REFERENCE BOOKS

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech.
2. Java Server Pages –Hans Bergsten, SPD O'Reilly Java Script, D. Flanagan, O'Reilly,SPD.
3. Beginning Web Programming–Jon Duckett WROX.
4. Programming World Wide Web, R. W. Sebesta, Fourth Edition, Pearson.
5. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.



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**CSE (DATA SCIENCE)
Web Technologies - C85PC1**

B.Tech. V Semester

**L/T/P/C
3/0/0/3**

COURSE OBJECTIVE:

1. To introduce PHP language for server-side scripting
2. To introduce XML and processing of XML Data with Java
3. To introduce Server-side programming with Java Servlets and JSP To introduce Client-side scripting with Javascript and AJAX

COURSE OUTCOMES:

After completion of this course, the student will be able to


1. Gain knowledge on implementing server side scripting using PHP, know how to store and process data using XML.
2. Understand how to handle http requests based on the knowledge of servelets
3. Learn to implement server side programming with servelets, JSP
4. Learn to implement client side scripting, validation of forms, JS, AJAX programming.

UNIT – I:

Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

UNIT – II:

XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java.


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**UNIT – III:**

Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization Parameters, Handling HTTP Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT – IV:

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

UNIT – V:

Client-side Scripting: Introduction to Javascript: Javascript language – declaring variables, the scope of variables, functions, event handlers (click, on submit etc.), Document Object Model, Form validation, Simple AJAX application.

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2. Java Server Pages –Hans Bergsten, SPD O'Reilly Java Script, D. Flanagan, O'Reilly,SPD.
3. Beginning Web Programming-Jon Duckett WROX.
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COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)

B.Tech. I Year II SEMESTER

L/T/P/C

3/0/0/3

INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING & DATA STRUCTURES USING JAVA (D2ESIOJ)

Course Objective:

To understand the features of object-oriented paradigm and Data Structure concepts using JAVA programming Language.

Course Outcomes:

- After completion of course, the students will be able to
1. Understand fundamentals of object-oriented programming in Java which includes defining classes, invoking methods
 2. Implement the inheritance concept
 3. Solve the exceptions in programs and recursion
 4. Implement the Basic data structures and operations
 5. Apply the ADTs and use the collections in Java

UNIT I

Object-Oriented Thinking

A way of viewing world – Agents and Communities, messages and methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method binding, Overriding and Exceptions, Summary of Object-Oriented concepts. History of object-oriented programming, overview of java, Object oriented design, Structure of java program, Java buzz words, Data types, Variables and Arrays, operators, expressions, control statements, Introducing classes, Methods and Classes, String handling.

Stream based I/O (java.io): The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output

UNIT II

Inheritance

Inheritance concept, Inheritance basics, Member access, Constructors, Creating Multilevel hierarchy, super uses, using final with inheritance, Polymorphism-adhoc polymorphism, pure polymorphism, method overriding, abstract classes, Object class, forms of inheritance-specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance.

Packages: Defining a Package, CLASSPATH, Access protection, importing packages. Interfaces Defining an interface, implementing interfaces, Nested interfaces, applying interfaces, variables in interfaces and extending interfaces.

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UNIT III**Exception Handling**

Fundamentals of exception handling, Exception types, Termination or presumptive models, Uncaught exceptions, using try and catch, multiple catch classes, nested try statements, throw, throws and finally, built-in exceptions, creating own exception sub classes.

Recursion: Analyzing Recursion Algorithms, Designing of Recursive Algorithms.

UNIT IV**Sorting, Searching & Data Structure**

Introduction to Sorting, Bubble Sort, Insertion Sort, Introduction to Searching, Linear Search and Binary Search.

Data Structures Fundamentals: Using Arrays, Singly Linked Lists, Circularly Linked Lists, Doubly Linked Lists.

Unit V**Stacks, Queues, and Deques**

Stack, Queue, Double-ended queues, List and Iterator


ADTs: The List ADT, Array List, Positional Lists, Iterators, Java Collection Frameworks

Text Books:

1. Java The complete reference, 9th edition, Herbert Schildt, Mc Graw Hill Education (India) Pvt. Ltd.
2. Data Structures & Algorithms in Java 6th Edition, Michale T. Goodrich, Roberto Tamssia, Michale H. Goldwasser, WILEY.

Reference Books:

1. An Introduction to programming and OODesign using Java, J. Nino and F. A. Hosch, John Wiley & sons.
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, and Universities Press.


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TKR College of Engineering & Technology
Department of CSE (AI&ML)
I. Minutes of Meeting held at TKRCET

5



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Approved by AICTE, Government of India, New Delhi, India on 10/01/2010
Approved by UGC, Government of India, New Delhi, India on 10/01/2010



CSE (AI&ML)

Board of Studies Meeting held on 15/10/2022 at 10.15AM

Agenda:


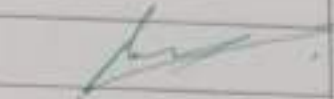
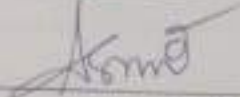


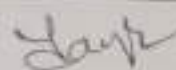
1. Finalization of R22 course structure with classification
2. Evaluation process
3. Discussion on CBT
4. New courses added in the curriculum

Minutes of Meeting

1. Course structure approval for R22 Regulation with following classification: HS with 11 credits, BS with 22 credits, ES with 23 credits, PC with 59 credits, PE with 18 credits, OE with 12 credits, PW with 15 credits
2. Each and every Semester constitutes with 20 credits total of 160 credits.
3. Internal evaluation for 40 Marks External Evaluation for 60 marks
4. No CBT for Internal Examination
5. Skill Development Course is added in V Semester in order to meet the requirement
6. Open electives are introduced in VI, VII and VIII in order to make the student in multi-disciplinary expertise
7. Professional electives which are related to Artificial Intelligence area and the technology related to the industrial needs are introduced in V, VI, VII, VIII of students choice in order to meet the choice based credit system
8. Project is introduced in VII and VIII semesters
9. Mandatory courses are introduced to enhance the skills of the student for societal needs.

Members

S.NO.	MEMBER NAME	SIGNATURE
1	Dr. G. Venkat Rami Reddy Professor of CSE, JNTUH-SIT	
2	Prof. R.B.V. Subramanyam Professor of CSE, NIT Warangal	

3	Dr. M. A. Hammeed Professor of CSE, Osmania University -COE	
4	Mr. Roop Kumar Raju, Industry Expert	
5	Dr. D.V. Ravi Shankar, Principal, TKRCET	
6	Dr. A. Suresh Rao Dean Academics and HoD CSE, TKRCET	
7	Dr. V. Krishna Professor of CSE (DS)and HoD, TKRCET	
8	Dr. B. Sunil Srinivas Professor of CSE and HoD, TKRCET	
9	Mrs. C. Jaya Lakshmi Asst. Professor, Subject Expert CSE(AI&ML), TKRCET	



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Department of Information Technology

Choice Based Credit System (CBCS)/Elective Course System : 2023-24

INFORMATION TECHNOLOGY	OPEN ELECTIVE	Principles of Electronic Communication System
		Micro Processor and Micro Controller
		Disaster Management
		Environmental Impact Assessment
	PROFESSIONAL ELECTIVE	1) Advanced Databases
		2) Network Programming
		3) Stack Technologies (IIIyear-IIsem)
		1) Distributed Databases
		2) Wireless Networks
		3) Mobile Application Development (IIIyear-IIsem)
PROFESSIONAL ELECTIVE	1) Introduction to Data Analytics	
	2) Mobile Adhoc Networks	
	3)Multimedia & Rich Internet Applications (IVyear-Isem)	
	1) Big Data Analytics	
	2) Social Networks	
	3) Internet of Things (IVyear-Isem)	
PROFESSIONAL ELECTIVE	1) Predictive Data Analytics	
	2) Storage Area Networks	
	3) Machine Learning (IVyear-IIsem)	
PROFESSIONAL ELECTIVE	1) Data Science	
	2) Semantic Web & Social Networks	
	3) Deep Learning (IVyear-IIsem)	


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Department of Information Technology

Choice Based Credit System (CBCS)/Elective Course System : 2023-24

INFORMATION TECHNOLOGY	OPEN ELECTIVE	Principles of Electronic Communication System
		Micro Processor and Micro Controller
		Disaster Management
		Environmental Impact Assessment
	PROFESSIONAL ELECTIVE	1) Advanced Databases
		2) Network Programming
		3) Stack Technologies (IIIyear-Isem)
		1) Distributed Databases
		2) Wireless Networks
		3) Mobile Application Development (IIIyear-Isem)
PROFESSIONAL ELECTIVE	1) Introduction to Data Analytics	
	2) Mobile Adhoc Networks	
	3)Multimedia & Rich Internet Applications (IVyear-Isem)	
	1) Big Data Analytics	
	2) Social Networks	
	3) Internet of Things (IVyear-Isem)	
PROFESSIONAL ELECTIVE	1) Predictive Data Analytics	
	2) Storage Area Networks	
	3) Machine Learning (IVyear-Isem)	
	1) Data Science	
PROFESSIONAL ELECTIVE	2) Semantic Web & Social Networks	
	3) Deep Learning (IVyear-Isem)	


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BoS (On-Line) meeting for approval of R22. III Year, IV Year Syllabus & Open Electives

Agenda of Meeting:

Reason for changing course structure from R20-R22 Inclusion of new courses.

Minutes of Meeting- Discuss about III Year, IV Year syllabus & open electives for R-22 Regulation.

Briefing of syllabus is given by HoD for Regular III Year & IV Year.

Course Structure in discussed by BOS Chairman Dr. B. Swapna Rani.

The progress in curriculum grouping based on course components for batch of 2022-2026 is done by categorizing 20.62% for Hs & BS, 14.30% ES, 57.5% PC & 7.5 % for inter disciplinary.

Engineering Sciences are important now a days as it helps the students to develop knowledge about different Career opportunities, problem-solving skills, and technological advancements. Therefore the categorization percentage has been increased from R20-R22 regulation by introducing Engineering Workshop and Python Programming Lab.

Changes in course structure are done, Compared to R-20 Regulation to meet.

- a) **Employability** is given weightage in Curriculum design & development, as the student can recruit as Embedded Systems Design Engineer, VLSI Design Engineer, Machine learning Engineer, Telecommunications Engineer etc.
- b) To provide thinking process in students, this facilitates the faculty to inculcate creativity & innovations in students.
- c) To have reasonable no. of multidisciplinary courses, where the structure is well organized with links progress one course to another course, steadily for good comprehension of all courses.
- d) The introduction of fundamental core courses in I Year to facilitate better understanding of Circuit related courses & develop affinity toward Dept.

The Cause of Revision and use of Revision of new Courses

1. Applied Python can be used in Circuit design and analysis, data acquisition and Processing, Control Systems, Signal Processing, Image processing, Machine learning etc.


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2. C++ & Data Structures is introduced in PE-I as it an essential for system level programming and Embedded system.
3. Mini Projects is introduced in 7th semester for the students to have practical exposure in the fields of IoT, Image processing, VLSI etc.
4. AI is the branch of Machine learning is introduced in PE-2, PE-3 as it has various ECE related applications such as Signal Processing, Data Compression, Error correction, Modulation, encrypts etc.
5. Advanced Communication Lab is introduced in the structure which helps the students to learn circuits for transmission & Receiving Analog & Digital Signals.
6. Students need to produce applications which have social benefits. They should be taught well-being of human society. Discipline & ethical issues related to what they create is important, in this regard Cyber Security in 6th semester & Professional Ethics in the 7th semester are introduced.
7. Discussed about open Electives that are to be offered to other dept.

Suggestions Given by the External board Committee.

- Committee has gone through course outcomes & suggested to articulation matrix in syllabus with cognitive level.
- Suggested Textbook names in syllabus copy should be in IEEE format suggested by committee.
- VLSI design subject pre requisite in required.
- "Testing of Chips" in VLSI subject syllabus.
- Cognitive names to be removed.
- Latest topics "Cognitive Radio" topic need to be added in syllabus has been suggested by committee in further regulations.
- Encryption Techniques should be added in open elective (Data Communication) subject.
- IV-I 5G Technology & 4G Syllabus is to be introduced in syllabus.
- Industrial visit for having good exposure to new technology in suggested by committee.
- Electromagnetic compatibility interface esteem need to be included in syllabus.
- Discussed about grading system also.


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BOS (ON-Line) For Approval of R-22
 Open Elective & III year & IV year syllabus

Agenda of Meeting

- Final approval of III year & IV year R-22 syllabus & open Elective syllabus.
- Reason for changing course structure.
- Inclusion of new courses.

Minutes of Meeting → No discuss about R-22 open Elec, III year & IV years syllabus.

- Briefing of syllabus is given by HOD regarding III year & IV year
- course structure is discussed by BOS chairman Dr. B. Swapnarani
- committee has gone through course coordination & suggested to articulation matrix in syllabus with cognitive levels
- suggested Textbook ⁱⁿ syllabus copy should be in IEEE format suggested by committee.
- VLSI design subject. Pre requisite is required
- 'Testing of chips' in VLSI subjects syllabus
- cognitive need to be removed

- latest topic "cognitive Radio" topic need to be added in syllabus has been suggest by committee to in further Regulations.
- Encryption Technique should be added in Open Elective (Data communication) subject.
- IV-S 5G Technology & 6G syllabus is to be introduced in syllabus.
- Industrial visit for having good exposure to new Technology is suggested by committee.
- Electromagnetic compatibility / interference subject need to be included in syllabus.
- Discussed about Grading System also.
- changes in course structure is done, compared to R-20 Regulation to meet
- Employability is given weightage in curricular design & development
 - To provide thinking process in students which facilitates faculty to stimulate creativity & innovation in students.
 - To have reasonable no of multidisciplinary courses, where the structure is well organised with linked program one course to another course, steadily for good comprehension of all courses.
 - The introduction of fundamental core courses in 1 year to facilitate better understanding of circuit related courses & develop affinity toward Dept.

→ Applied Python

- C++ & Data structures is introduced as in PE-I as it is essential for system level programs of embedded system.
- Mini Projects is introduced in 7th semester for the students to have practical exposure in the fields of IOT, image processing, VLSI etc.
- MAI is branch of Machine Learning is introduced in PE-2, PE-3 as it has various ECE related applications such as signal processing, data compression, error correction, modulation, Encryption etc.
- Advanced communication lab is introduced in the structure which helps the students to learn how to design CKTs for transmission & Receiving analog & Digital signals.
- Students need to produce applications which have social benefits, they should be taught well being of human society, Discipline of ethical issues related to what they create. In this regard professional Ethics is a subject included in 7th sem of Cyber Security in 6th Sem.
- The program curriculum grouping based course components for batch of 2022-2026 is done by following 20% for HS & B.S, 14.30% ES, 57.5% PC & 7.5% for interdisciplinary.
- Discussed about open Electives, that are to be offered to other Dept.
- Mini Projects in Vsem is evaluated 40 marks for Internal & 60 marks for external during course work. The student is declared to have failed if he/she: 1. Doesn't submit report 2. Doesn't make presentation before internal or external committee during course work. 3. Score less than 40% marks.



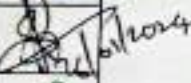







Members of BOS

1. Dr. A. Rajani
Prof & H.O.D., JNTUH. A.Rajani
2. Dr. B. Rajendra Naik.
Prof, University College of Engg. O.U. B.R.Naik
3. ~~Dr.~~ N. P. Supriya.
Scientist 'E', Defence
Electronics Research Lab (DLRL), HYD N.P.
4. Dr. C. Venkata Narasimhulu.
Prof & Principal - CBIT, HYD C.V.N.
5. Dr. M. Mahesh.
Prof, H.O.D. M.Mahesh
26/01/2024
6. Dr. D. Nageshwar Rao.
Prof, COE - TKRCEET
Senior Staff. D.N.Rao
26/01/2024
7. Dr. B. Swapna Rani
Assoc. Prof, BOS Chairperson B.S.Rani
26/01/2024
8. Dr. J. Smittha Kumari
Assoc. Prof, Senior Staff. J.S.Kumari
31/01/2024
9. ~~ms~~ M. Sudha Rani
Assoc. Prof, Senior Staff K. Srinivasan
26/01/2024
10. Ms. Ganesh, Asst. Prof. Ganesh
26.01.24

Composition of BOS

Board of studies of every department shall be constitute as per the Good Governance Document guidelines

Date:26.01.2024

S. No	Category	Name	Position (Status)	Designation in BOS	Subject Specialization	Contact No.	Email ID	Sign
1	Head of the Department concerned.	Dr.Mahesh	Professor, HoD	Member	Image Processing	8309165487	maskimahesh@tkrcet.com	
2	Senior Staff of the Dept.	Dr.D.Nageshwar Rao	Prof of ECE & CoE	Member	VLSI Design	9912713150	nageshwarrao@tkrcet.com	
3	Senior Staff of the Dept.	Dr.B.Swapna Rani	Assoc. Prof,	Chairman	VLSI Design	9866104554	swapnarani@tkrcet.com	
4	Two experts in the subject from outside the college to be nominated by Academic council.	Dr. B. Rajendra Naik	Professor, Dept of ECE, Univeristy College of Engineering Osmania University,Hyd	Member	VLSI Design	9441222226	rajendranaikb@osmania.ac.in	
		Dr.C. Venkata Narashimlu	Principal & Professor Dept of ECE, CBIT,Hyd	Member	Signal & Image Processing	9866472744	principal@cbit.ac.in	
5	One expert nominated from a panel of six recommended by the Vice chancellor of University (University Nominee)	Dr. A. Rajani	Professor & HoD, Department of ECE, JNTUH, Hyderabad	Member	Signal & Image Processing	9989922228	rajani.akula@jntuh.ac.in	
6	One representative from industry/Corporate sector/allied area relating to placement.	Dr. N.P.Supriya	Scientist 'D' Defence Electronics Research Laboratory(DLRL),Hyd	Member	Electromagnetic Compatibility	9490956264	supriya.np.drl@gov.in	
7	One postgraduate meritorious alumnus to be nominated by the principal.	S.Prathyusha	Asst.Prof,Dept of ECE Teegala Krishna Reddy Engineering College	Member	VLSI Design	9705269485	prathyusha.415@gmail.com	
8	Staff of The ECE Department	Ms. Ch. Divya	Asst.Prof	Member	Embedded Systems	9550899776	divyachitra@tkrcet.com	
9	Staff of The ECE Department	Ms. K. Shalini	Asst.Prof	Member	Embedded Systems	8686065979	shalinik@tkrcet.com	



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B.TECH. - ELECTRONICS & COMMUNICATION ENGINEERING

Course Structure R-22

SEMESTER V

S. No.	Course Classification	Course Code	Name of the Subject	L	T	P	C	I	E	Total
1	PC	D45PC15	Control Systems	3	1	0	4	40	60	100
2	PC	D45PC16	Microprocessors and Microcontrollers	3	0	0	3	40	60	100
3	HS	D5HSBF	Business Economics and Financial Analysis	3	0	0	3	40	60	100
4	PE	D45PE1	Professional Elective-I 1.C++ and Data Structures 2. Data Communications and Computer Networks 3. Introduction to Embedded Systems 4. Artificial Intelligence	3	0	0	3	40	60	100
5	OE	D45OE1	Open Elective-I	3	0	0	3	40	60	100
6	PC	D45PC17	Microprocessor & Microcontrollers Lab	0	0	2	1	40	60	100
7	PC	D45PC18	Advanced Communications Lab	0	0	2	1	40	60	100
8	HS	D5HSE3	Advanced English Communication Skills Lab	0	0	4	2	40	60	100
9	MC*	MC005	Entrepreneurship*	3	0	0	0	0	0	0
TOTAL				18	1	8	20	320	480	800

University Nominee (Subject Expert)

Name: Dr. A Rajani

Signature:

External Subject Expert-I

Name: Dr. B. Rajendra Naik

Signature:

Dr. B. Swapna Rani

Chairman BoS

Industry Nominee (Subject Expert)

Name: Dr. N.P. Supriya

Signature:

External Subject Expert-II

Name: Dr. C. Venkata Narashimlu

Signature:

Dr. D. Nageshwar Rao

Senior Staff

Dr. M. Mahesh

HoD, ECE



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B.TECH. - ELECTRONICS & COMMUNICATION ENGINEERING

Course Structure R-22

SEMESTER VI

S. No.	Course Classification	Course Code	Name of the Subject	L	T	P	C	I	E	Total
1	PC	D46PC19	Antennas and Wave Propagation	3	0	0	3	40	60	100
2	PC	D46PC20	Digital Signal Processing	3	1	0	4	40	60	100
3	PC	D46PC21	VLSI Design	3	0	0	3	40	60	100
4	PE	D46PE2	Professional Elective-II 1. Digital Design through Verilog HDL 2. Cellular and Mobile Communications 3. Advanced Microcontrollers 4. Digital Image Processing	3	0	0	3	40	60	100
5	OE	D46OE2	Open Elective-II	3	0	0	3	40	60	100
6	PC	D46PC22	Digital Signal Processing Lab	0	0	2	1	40	60	100
7	PC	D46PC23	VLSI Design Lab	0	0	2	1	40	60	100
8	PC	D46PC24	Internet of Things Lab	0	0	2	1	40	60	100
9	PC	D46PC25	Mini Projects	0	0	2	1	40	60	100
10	MC*	MC006	Cyber Security*	3	0	0	0	0	0	0
TOTAL				18	1	8	20	360	540	900

University Nominee (Subject Expert)

Name: Dr. A Rajani

Signature:

Industry Nominee (Subject Expert)

Name: Dr. N.P. Supriya

Signature:

External Subject Expert-I

Name: Dr. B. Rajendra Naik

Signature:

Dr. B. Swapna Rani

Chairman BoS

External Subject Expert-II

Name: Dr. C. Venkata Narashimlu

Signature:

Dr. D. Nageshwar Rao

Senior Staff

Dr. M. Mahesh

HoD, ECE



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B.TECH. - ELECTRONICS & COMMUNICATION ENGINEERING

Course Structure R-22

SEMESTER VII

S. No.	Course Classification	Course Code	Name of the Subject	L	T	P	C	I	E	Total
1	PC	D47PC26	Microwave Engineering	3	1	0	4	40	60	100
2	HS	D7HSPE	Professional Ethics	2	0	0	2	40	60	100
3	PE	D47PE3	Professional Elective -III 1. Analog and Digital IC Design 2. Radar Engineering 3. Embedded System Design 4. Machine Learning	3	0	0	3	40	60	100
4	PE	D47PE4	Professional Elective -IV 1. Low Power VLSI Design 2. Satellite Communications 3. Real Time Operating Systems 4. Artificial Neural Networks	3	0	0	3	40	60	100
5	PC	D47PC27	Microwave Engineering Lab	0	0	2	1	40	60	100
6	PW	D47PW1	Project Stage-I	0	0	14	7	100		100
TOTAL				11	1	16	20	300	300	600

University Nominee (Subject Expert)

Name: Dr. A Rajani

Signature:

Industry Nominee (Subject Expert)

Name: Dr. N.P. Supriya

Signature:

External Subject Expert-I

Name: Dr. B. Rajendra Naik

Signature:

Dr. B. Swapna Rani

Chairman BoS

External Subject Expert-II

Name: Dr. C. Venkata Narashimlu

Signature:

Dr. D. Nageshwar Rao

Senior Staff

Dr. M. Mahesh

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B.TECH. - ELECTRONICS & COMMUNICATION ENGINEERING

Course Structure R-22

SEMESTER VIII

S. No.	Course Classification	Course Code	Name of the Subject	L	T	P	C	I	E	Total
1	PE	D48PE5	Professional Elective –V 1.Memory Technologies 2. Optical Fiber Communications 3. Embedded C 4. Electronic Measurements and Instrumentation	3	0	0	3	40	60	100
2	PE	D48PE6	Professional Elective –VI 1.CPLD & FPGA Architectures and Applications 2. 5G Technology 3. ARM Architectures & Interface Protocols 4. Digital Signal Processors and Architectures	3	0	0	3	40	60	100
3	OE	D48OE3	Open Elective –III	3	0	0	3	40	60	100
4	OE	D48OE4	Open Elective –IV	3	0	0	3	40	60	100
5	PW	D48PW2	Project Stage-II	0	0	16	6	40	60	100
6		D48PWCV	Comprehensive Viva-Voce				1	100		100
7		D48PWTS	Technical Seminar				1	100		100
TOTAL				12	0	22	20	400	300	700

University Nominee (Subject Expert)

Name: Dr. A Rajani

Signature:

Industry Nominee (Subject Expert)

Name: Dr. N.P. Supriya

Signature:

External Subject Expert-I

Name: Dr. B. Rajendra Naik

Signature:

External Subject Expert-II

Name: Dr. C. Venkata Narashimlu

Signature:

Dr. B. Swapna Rani
Chairman BoS

Dr. D. Nageshwar Rao
Senior Staff

Dr. M. Mahesh
HoD, ECE

Dt. 27.01.2024
(online mode)

Agenda: 1. R22 Model curriculum and detailed syllabus approvals for R22 III and IV years

2. Approval of R22 open Electives offered to other departments

3. Major changes of R22 syllabus subject w.r.t R20 syllabus

a) In Semester V, Title "Hydrology & water resources Engineering" has been renamed to "Water Resources Engineering-I"

b) In Semester V, In 'Design of reinforced concrete structures', Unit III & Unit IV are swapped

c) In Semester V, In 'Computer Aided Detailed Drawing Lab', three experiments are added and three experiments are removed w.r.t R20 syllabus to cover all the topics.

d) In Semester VI, In 'Soil Mechanics' Unit II - 'Critical Hydraulic gradient' topic is added.

In Unit V: in types of laboratory tests for strength parameters; direct shear test, tri axial compression Test, unconfined compression Test, Van Shear

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test were included and "Skempton's pore water parameters" topic is added.
 e) 9u semester VI, in "Environmental Engineering", in Unit IV, "Wetland Management" topic is added and in Unit V: "Noise pollution: causes and effects of noise pollution - measurement of noise pollution, Standard Values" is added.

f) 9u Semester VI, in "Design of steel structures", Unit III; plastic Theory - Theorem of plastic Analysis, plastic moment" are removed.

g) 9u Semester VI, in "Soil mechanics lab", experiment no. 1 has been modified to "Determination of Specific gravity of soil by pycnometer".


h) 9u GIS Lab (Geographic information System Lab), 9 experiments were added in addition 5 experiments of R20 syllabus.

i) 9u Semester VII, in "Ground water Development and Management" (PE IV), in Unit IV, Aerial photogrammetry - Applications is removed.



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j) In Semester VII, in "Environmental Engineering Lab", Exp 16: "Introduction to Bacteriological Analysis" is removed.

k) In Semester III, in "Construction project planning Management", Unit V, occupational & safety hazard assessment" Topic is removed

Members present:

1. Dr. G.V. Narasimha Reddy - ~~Present~~
(University Nominee)
2. V. Sai Vikas - Chairman - V. Sai Vikas
3. K.V.R. Satya Sai - HOD/civil - ~~Present~~
4. Dr. CSV Subramanya Kumar - ~~Present~~
(Ext. Member)
5. Dr. Hari prasad - Hari
(Ext. Member)
6. M. Mallareddy - Ext. Member - Mallareddy
(from industry)
7. B. praveen - Member - ~~Present~~

8. Md. Burhan Ahmed - Member - ~~Present~~ Principal