Course Code	D. 11	d Decree mening	L	T	P	С
20AES0501	Problem Solving An	a Programming	3	0	0	3
Pre-requisite	Basic Mathematics	Semester			I - I	
Course Objectives:						
 Introduce the Identify the co Teach the syn Demonstrate t Illustrate the r 	internal parts of a computer, and perip Concept of Algorithm and use it to solve mputational and non-computational pr tax and semantics of a C Programming the use of Control structures of C Progra methodology for solving Computational	e computational problem oblems language amming language	ns			
Course Outcomes (
CO2: Able to kno CO3: Able to kno CO4: Able to solv	w interconnection of peripherals and co w problem solving aspects and design a w c language basics ,flow control, input e some computational problems using la anise real world heterogeneous data an	and analysis of algorithm toutput and implementa functions array and poir	n ation fur aters	nction iiques		xception
Computer Fundam	entals: What is a Computer, Evolu-	ution of Computers			of Con	nputers,
generation language Pseudo-code, Flowe for converting algori UNIT - II ntroduction to complementation of algori undamental algori	er, Interpreter, Loader, Linker, Programs, Classification of Programming langularts, Strategy for designing algorithms thms into programs. Imputer problem solving: Introduct gorithms, the efficiency of algorithms, as thms: Exchanging the values of two	ages, Structured progras, Tracing an algorithm the problem-solving the analysis of algority variables, counting, sur	9 Hing aspethms.	conce ct logi rs ect, t	ept, Algo c, Spec op-dow	n design
actorial computation nteger.	, sine function computation, generation	n of the Fibonacci seque			g the a	igits of a
UNIT - III			8 H			
perators, relational perators, assignmer aput and output: st control Flow: State ontinue, Goto and la functions and Prop	nd Expressions: Variable names, data and logical operators, type convers it operators and expressions, conditional andard input and output, formatted out ments and blocks, if-else, else-if, swite abels. gram Structure: Basics of functions, if the variables, register variables, block states.	ions, increment and coll expressions precedence to the precedence	lecrements and on the second of the second o	nt op rder o anf. -Do-	erators f evalua while, l ternal	, bitwise ation. break an variables,
UNIT - IV			9 H:	rs .		
ivisor of two integer, cointers and arrays rithmetic, characte nitialization of array omplicated declarations array Techniques:	Finding the square root of a number, to generating prime numbers. So Pointers and addresses, pointers and pointers and functions, pointer arrays, pointer vs. multi-dimensional arrayons. Array order reversal, finding the maximal with smallest element	nd function arguments, ray; pointers to pointe ys, command line argu	pointer rs, Mul iments,	s and ti-din point	l arrays nension ers to	s, addres al array function
NIT - V			9 H	rs	-	
1411 - V	ing: Sorting by selection, sorting by ex	schange corried by inc				
orting and Search inary search. tructures: Basics eferential structures ome other Feature	of structures, structures and function, table lookup, typedef, unions, bit-field ss: Variable-length argument lists, formund Output, Miscellaneous Functions.	s, arrays of structures	s, pointe	ers to	struct	ures, sel

3. Brian W. Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2rd Edition, Pearson.

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(1)

Reference Books:

- 1. RS Dichkar "Programming with C", 2012, Universities Frems
- Pelin Aksov, and Laura Denardia, "Information Technology in Theory", 2017, Cengage Learning.
- 3. Byron Gottfried and Jitender Kumar Chlinbra, "Programming with C", 4th Edition, 2019, McGraw Hill Education.

Online Learning Resources:

www.nptcl.nc.in

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Mapping o	PO1	PO2	POS	PO4	POS	PO6	PO7	РОЯ	PO9	PO10	PO11	PO12	P8O1	P802	
COL	1	2											3		1
CO2	3	3												1	
cos	2	3	3											•	-
CO4	2	1	3	2											1
COS	2	1	3	3	2			2				3	1	1	1

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

C. Protop - Silas Ores Janapala - from of m

HEAD Dept. of Computer Science a Engg Annamacnarya Institute of thnology & Sciences, Tirupati-5:

Course Code 20APE0501 Pre-requisite Basic Mathems ourse Objectives: To know the basic concepts and prince Learn pre-processing techniques and Learn and create multidimensional in Study and evaluate performance of Fr. Understand and Compare different by Course Outcomes: CO1: Understand the basic concepts CO2: Apply OLAP technology for Data CO3: Analyze and evaluate performance of Fr. Data Mining Co5: Analyze and evaluate performance of Fr. Pundamentals of data in the second Edition. Discretization of a data Mining. Data Preprocessing: Necesiata Reduction. Discretization and Constructions and Construction. Discretization and Constructions. Purther Development of Editions Methods. Mining various kinds Based Association Mining. Classification Decision Tree Induction, Bayesian Classification of the Computation, Purther Development of Editions Methods. Mining various kinds Based Association Mining, Classification Decision Tree Induction, Bayesian Classification of the Computation of the Methods. Mining various kinds Based Association Mining, Classification of the Methods Clustering High- Dimensiona UNIT - IV Cluster Analysis: Introduction, Type Puritioning Methods, Hierarchical Methods Clustering High- Dimensiona UNIT - V Mining Streams, Time Series and S. Fatterns in Transactional Data Mining, Mining Alberton Data Mining of Complex Discretization of the Methods of Construction of Data Mining - Pan Reference Books: 1. Data Mining Concepts and Technological Mining Techniques, Arin KF. Data Mining T	ples of dalata mining dels for expuent lite on the solution of Data W Warehouse of Asserting for Prepiept Hiera ogy for interest of Assorting and President of Assorting as of Data ethods.	data warehouse ise occation Roles ise occation Roles is mentation and OLA! Correlation Role ediction: A Rule Bay Learners or a Pred a in Clus Density Bunstranti-	busing an inables tousing and data and data and data arises and the Data, ration in mig: Data, Further and Data is From / Issues Resed Class, Other Canad Met Based Clustased Met Based Clustased Met Based Clustased Met Based Clustased Clustased Clustased Clustased Met Based Clustased Met Based Clustased Clustased Clustased Met Based Clustased Clustased Met Based Clustased Cl	Mining classification Puriod Mining Classification Data Control Contro	Sections algorithms also algorithms algorith	M	oH cube Terent Variation of Marian discountribution of Prediction of Prediction	firs fining system Ma and Trail frs fining system Ma and Trail frs fining system finin	Model From Data Data Construct Sanfoato Surp and	Data Data Data Data Data Data Data Data
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POI	PO2	PO3	PO4	PO5	P06	PO7	POB	P09	PO10	PO11	PC	012	PE	801	P80
CO1 3	2	3	2				1	The Carrie			1	-	1	2	-
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CO2 3	3			aga a terrapidade i recons	mer to the				-		1		-		
CO3 3	3														
CO4 2	3	3												2	
CO5 3	3	3	3											2	2
Levels of Cor	relation,	viz., 1-L	ow, 2-Mo	derate,	3 High	j		W.	P.		1		T.	1	1
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Dept. of Computer Science a Engg.
Annamacnarya Institute of thnology & Sciences. Tirubati-5:

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: III	Semester: II	Bran	ch of S	Study:	AI & DS
COURSE CODE	COURSE TITLE	L	Т	P	CREDITS
20APC3020	Big Data Analytics	3	0	0	3

Course Outcomes

Upon completion of the course, the students should be able to.

CO1: Understand the concepts and challenges of big data

CO2: Outline the operations viz. Collect, manage, store, query, and analyze various forms of big data.

CO3: Apply large-scale analytic tools to solve some of the open big data problems.

CO4: Analyze the impact of big data for business decisions and strategies.

CO5: Design different big data applications.

UNIT - 1:

Introduction to Big Data: What is Big Data? Why Big Data is Important? Meet Hadoop, Data, Data Storage and Analysis, Comparison with other systems, History of Apache Hadoop, Hadoop Ecosystem, VMWare Installation of Hadoop, Analyzing the Data with Hadoop, Scaling Out.

UNIT - 2:

FS: The Design of HDFS, HDFS Concepts, The Command-Line Interface, Hadoop File systems, The Java Interface, Data flow.

MapReduce: Developing a MapReduce application, The Configuration API. Setting up the Development Environment, Running Locally on Test Data, Running on a Cluster

UNIT - 3

How MapReduce Works: Anatomy of a MapReduce, Job Run. Failures, Shuffle and Sort, Task Execution. MapReduce Types and Formats:MapReduce Types, Input formats, output formats.

UNIT - 4:

Hadoop Environment: Setting up a Hadoop Cluster, Cluster specification. Cluster Setup and Installation, Hadoop Configuration, Security.

Pig: Installing and Running Pig, an Example, Comparison with Databases, Pig Latin, User- Defined Functions, Data Processing Operators.

UNIT - 5:

Hive: Installing Hive, Running Hive, Comparison with traditional Databases, HiveQL, Tables, Querying Data. **Spark:** Installing Spark, Resilient Distributed Datasets, Shared Variables, Anatomy of a Spark Job Run. HBase: HBasics, Installation, clients, Building an Online Query Application.

Text Books:

- 1. Tom White, "Hadoop: The Definitive Guide"Fourth Edition, O'reilly Media, 2015.
- Big Data, Big Analytics. Emerging business intelligence and analytic trends for today's businesses, Michael Minnelli, Michaele Chambers, and Ambiga Dhiraj, Wiley Cio Series

Reference Books:

- Glenn J. Myatt. Making Sense of Data , John Wiley & Sons, 2007 Pete Warden, Big Data Glossary, O'Reilly, 2011.
- 2. Michael Berthold, David J. Hand, Intelligent Data Analysis, Spingers, 2007.
- Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, Uderstanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw Hill Publishing, 2012.
- Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets Cambridge University Press, 2012.

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO1 0	PO1	PO1 2	PSO 1	PSO 2
CO1	2	3	2							1		3	2	2
CO2	2	3	2		3					1		3		2
соз	2	3	2		3					1		3		2
CO4	2	3	3		3				DE V	1		3	2	2
COS	2	3	2		3					1		3	-	2

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & Engg Annamacnarya Institute of Shnotogy & Sciences, Tirupati-5

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::TIRUPATI(AUTONOMOUS)

Year: III	Semester: II	Bran	ch of S	Study:	AI & DS
COURSE CODE	COURSE TITLE	L	Т	P	CREDITS
20APE3004	Software Engineering for AI	3	0	0	3

Course Outcomes

CO1: Understand the methods and issues in software engineering

CO2: Apply the principles of Artificial Intelligence for Software engineering

CO3: Design Al based software

CO4: Apply the algorithms of Machine learning in solving problems

CO5: Design Expert systems

UNIT - 1: Introduction to Computer Software for AI, AI Problems and Conventional SE Problems, Software Engineering Methodology

Computers and software systems, An introduction to Software engineering, Bridges and buildings versus software systems, the software crisis. A demand for more software power, Responsiveness to human users, Software systems in new types of domains. Responsiveness to dynamic usage environments, Software systems with self-maintenance capabilities. A need for Al systems

What is an Al problem. Ill-defined specifications, correct versus good enough solutions. It is the HOW not the

X T, the problem of dynamics, the quality of modular approximations, Context-free problems?

Specify and verify—the SAV methodology, the myth of complete specification, what is verifiable, Specify and test—the SAT methodology, testing for reliability, the strengths, the weaknesses, what are the requirements for testing, what's in a specification, Prototyping as a link.

UNIT - 2: An Incremental and Exploratory Methodology, New Paradigms for System Engineering

Classical methodology and Al problems, The RUDE cycle, how do we start, Malleable software, Al muscles on a conventional skeleton How do we proceed, how do we finish, The question of hacking, Conventional paradigms Automatic programming. Transformational implementation, The "new paradigm" of Blazer, Cheatham and Green, Operational requirements of Kowalski, The POLITE methodology

UNIT -3: Towards a Discipline of Exploratory Programming, Machine Learning: Much Promise, Many Problems

Reverse engineering. Reusable software Design knowledge, Stepwise abstraction, The problem of decompiling, Controlled modification. Structured growth

Self-adaptive software. The promise of increased software power, The threat of increased software problems

UNIT - 4: Machine Learning and Expert Systems

Practical machine learning examples, Multisession inductive programming, Expert Systems: The Success Story, Expert systems as Al software, Engineering expert systems, The lessons of expert systems for engineering Al software

UNIT - 5: AI into Practical Software

Support environments, Reduction of effective complexity, Moderately stupid assistance, An engineering toolbox, Self-reflective software. Over engineering software. Summary and What the Future Holds

TAT BOOKS:

1. Derek Partridge, "Artificial Intelligence and Software Engineering", Glenlake Publishing Company, 1998.

REFERENCES:

1. "The role of Artificial Intelligence in Software Engineering", K. Nitalksheswara Rao, 2020

 *Farid Meziane &Sunil Vadera, "Artificial Intelligence Applications for Improved Software Engineering Development", Information Science Reference, 2009

Mapping of course outcomes with program outcomes

	PO1	PO2	РОЗ	P04	PO5	P06	P07	PO8	P09	PO1 0	PO1	PO1 2	PSO 1	PSO 2
CO1	3						10.00							
CO2	3	3	2	2	2					2			2	
соз	3	2	2						1				1	1
CO4	3	3	2	2	2								2	
COS	3	2	2							2			1	1

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & East Annamacnarya Institute of thnology & Sciences, Tirupati-5

Course Code	Cryptography and Network	Security	L	т	Р	С
- 20APC 3613		· · · · · · · · · · · · · · · · · · ·	3	0	0	3
Pre-requisite	Computer Networks	Semester			111 -	
Course Outcomes	•		-1			
CO2: Identify var CO3: Outline var CO4: Design secu	I basic Cryptographic algorithm, Security issues nous type of vulnerabilities of a computer networious Security algorithms, are system the threads and identify the solution for the thre					
UNIT - I	Introduction		19 Hr	S		
and Techniques: In encryption and decr cossible types of atte	Introduction, The need for security, Security curity services, Security Mechanisms, A model troduction, plain text and cipher text, substitutely symmetric and asymmetric key cryptograncks.	nor Network Sect	irity Ci	Z.bto	graphy	Concep
UNIT - II	Ciphers		9 Hrs			
unction, Key distrib fellman, ECC), Key I						
UNIT - III	Authentication		9 Hrs			
uthentication codes inapsack algorithm. UNIT – IV	tion Algorithms and Hash Functions: Authors, Hash Functions, Secure hash algorithm, W.	tication requirent hirlpool, HMAC,	cnts, CMAC	Fund , Dig	tions, gital si	Messag gnature
	Security		9 Hrs			
-Mail Security: Pro	etty Good Privacy, S/MIME IP Security: IP Se	ecurity overview,	IP Se	curit	y arc	hitecture
UNIT - V	er, encapsulating security payload, combining sec	urity associations	, kcy n 9 Hrs	nanaj	gemen	t
Veb Security: Web s	ecurity considerations, Secure Socket Layer and	T				
elated threats, Coun	s, Virus and Firewalls: Intruders, Intrusion del termeasures, Firewall design principles, Types of I branch Payment Transactions, Cross site Scription	fection, password	l mana	igem	ent, V	
2. Atul Kanate, Cr	s, "Cryptography and Network Security", 5th Editic yptography and Network Security", 2nd Edition, M s "Network Security and Cryptography", 1stEdition	Ac Graw Hill 2014	2			
	d Network Security: C K Shyamala, N Harini, Dr T	P.D.J.				
 Cryptography an Information Secu Principles of Com Introduction to N 	d Network Security: C K Shyanaia, N Hanni, Dr I d Network Security: Forouzan Mukhopadhyay, Mo irity, Principles, and Practice: Mark Stamp, Wiley aputer Security: WM. Arthur Conklin, Greg White, letwork Security: Neal Krawetz, CENGAGE Learnit and Cryptography: Bernard Menezes, CENGAGE	e Graw Hill, 3rd E India. TMH	i, Wiley dition	, 1st	Editio	n.
nline Learning Res		1/2		-	_	
ttps://onlinecourse	es.nptel.ac.in/noc21_cs16/preview		-			
- 1-1-1	comes with program outcomes					

	PO	PO2	PO3	P04	PO5	P06	PO7	PO8	PO9	PO1	PO1	PO12	PSO1	PSO2
COI	3													
CO2	3	2												
соз	2	3												2
CO4	.3		2											
CO5	3			3									3	

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

Dept. of Computer Science & Engg.

Annamacnarya Institute of :hnology & Sciences, Tirupati-5

Course Code Embedded Systems and Internet of Things 5011 3015 Digital Electronics and Microcontroller Semester Pre requisite Course Outcomes (CO): CO1: Understand the Fundamental Concept of Embedded System CO2: Analyze TM4C Architecture, Instruction Set, addressing modes to develop programs for various applications using Assembly and Embedded C CO3: Develop an embedded system by interfacing the inicrecontrollers and IDE tools CO4: Understand the basic concept of Internet of Things CO5: Implement the IoT basic application by Arduino Microcontroller. Introduction To Embedded Systems UNIT - I Embedded system introduction, host and target concept, embedded applications, features and architecture considerations for embedded systems. ROM, RAM, timers; data and address bus concept, Embedded Processor and their types. Memory types, overview of design process of embedded systems, programming languages and tools or embedded design Embedded Processor Architecture UNIT - II CISC Vs RISC design philosophy, Von-Neumann Vs Harvard architecture. Introduction to ARM architecture and Cortex - M series, Introduction to the TM4C family viz. TM4C123x & TM4C129x and its targeted applications TM4C block diagram, address space, on-chip peripherals (analog and digital) Register sets, addressing modes and instruction set basics Overview Of Microcontroller And Embedded Systems UNIT - III Embedded hardware and various building blocks, Processor Selection for an Embedded System, Interfacing ocessor. Memories and 1/O Devices, 1/O Devices and 1/O interfacing concepts, Timer and Counting Devices, Serial Communication and Advanced I/O, Buses between the Networked Multiple Devices. Embedded System Design and Co-design Issues in System Development Process, Design Cycle in the Development Phase for an Embedded System. UNIT - IV Introduction to IoT introduction to Internet of Things: Characteristics of IoT, Design principles of IoT, IoT Architecture and Protocols Enabling Technologies for loT, loT levels and loT vs M2M, loT Design Methodology: Design methodology Challenges in IoT Design, IoT System Management, IoT Servers - Sensors. Arduino in IoT Basics of Arduino: Introduction to Arduino - Types of Arduino - Arduino Toolchain - Arduino Programming Structure - Sketches - Pins -Input/Output From Pins Using Sketches - Introduction to Arduino Shields integration of Sensors and Actuators with Arduino- Connecting LEDs with Arduino, Connecting LCD with Arduino Tinkercad arduino simulation. Textbooks: Embedded System Design: Embedded Systems Foundations of Cyber-Physical Systems, and the Internet of Things 4th ed. 2021 Edition by Peter Marwedel. Embedded System A Complete Guide - 2020 Edition by Gerardus Blokdyk Ti Tiva Arm Programming for Embedded Systems: Programming Arm Cortex-M4 Tm4c123g with C (Mazidi & Naimi Arm) Paperback, 2017. Building Arduino Projects for the Internet of Things: Experiments with Real-World Applications, 2016 by Adrel Javed. Reference Books: Michael J. Pont, "Embedded C", Pearson Education, 2007. Robert Barton, Patrick Grossetete, David Hanes, Jerome Henry, Gonzalo Salgueiro, *loT Fundamentals Networking Technologies, Protocols, and Use Cases for the Internet of Things, CISCO Press, 2017. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006. IOT (Internet of Things) Programming: A Simple and Fast Way of Learning, IOT Kindle Edition.
Andrew N Sloss, D. Symes, C. Wright, "Arm System Developers Guide", Morgan Kauffman/ Elsevier, 2006. Arshdeep Bahga, Vijay Madisetti, "Internet of Things: A Hands-on Approach", VPT, 2014. Online Learning Resources: https://nptel.ac.in/courses/128108016

Dept. of Computer Science a Engy Annamacnarya Institute of hnology & Sciences, Tirupati-51

1-1.1- DIRML filey

ANNAMACHARYAINSTITUTEOFTECHNOLOGYANDSCIENCES::TIRUPATI (AUTONOMOUS)

Year: II	Semester: I	Branch of Study: AI & ML						
COURSECODE	COURSETITLE	L	Т	P	CREDITS			
20APC3302	Database Management Systems (Common to: CSE, CIC, AI & ML, AI & DS,	3	0	0	3			
	ECE)							

COURSE OBJECTIVES:

This course is designed to

- Train in the fundamental concepts of database management systems, database modeling and design, SQL, PL, SQL and system implementation techniques.
- Enable students to model ER diagrams for any customized application
- · Inducting appropriate strategies for optimization of queries.
- · Provide knowledge on transaction and concurrency techniques

COUSEOUTCOMES:

After completion of the course, students will be able to

CO1: know the fundamentals of Databases CO2: Understand SQL and PL/SQL Concepts

CO3: Design a database for a real-world information system

CO4: Process and Optimize the query

CO5: Working of transaction and concurrency techniques in real time applications

UNIT-1:

Introduction: Database systems applications, Purpose of Database Systems, view of Data, Database Languages, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database users and Administrators, Introduction to Relational Model: Structure of Relational Databases Database Schema, Keys, Schema Diagrams, Relational Query Languages, Relational Operations

UNIT -2:

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries. Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Sub-queries. Modification of the Database. Intermediate SQL: Joint Expressions, Views, Transactions, Integrity Constraints, SQL Data types and schemas, Authorization.

Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, OLAP, Formal relational query languages

UNIT-3:

Database Design and the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Removing Redundant Attributes in Entity Sets, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues.

Relational Database Design:

Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Functional-Dependency Theory, Algorithms for Decomposition, Decomposition Using Multivalued Dependencies, More Normal Forms.

UNIT-4:

Query Processing: Overview, Measures of Query cost, Selection operation, sorting, Join Operation, other operations, Evaluation of Expressions.

Query optimization: Overview, Transformation of Relational Expressions, Estimating statistics of Expression results. Choice of Evaluation Plans, Materialized views, Advanced Topics in Query Optimization.

UNIT-5:

Transaction Management: Transactions: Concept, A Simple Transactional Model, Storage Structures,

Dept. of Computer Science & Engg Annamacnarya Institute of hnology & Sciences, Tirupati-5 Transaction Isolation Levels, Implementation of Isolation Levels, Transactions as SQL Statements.

Concurrency Control: Lock-based Protocols, Deadlock Handling, Multiple granularity, Timestamp-based Protocols, and Validation-based Protocols

Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, Early Lock Release and Logical Undo Operations

TEXT BOOKS:

- 1. A. Silberschatz, H.F.Korth, S.Sudarshan, -Database System Concepts1,6/c, TMH 2019
- 2. Database Management System, 6/c Ramez Elmasri, Shamkant B. Navathe, PEA

REFERENCES:

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- 1. Database Management System, 6/e Ramez Elmasri, Shamkant B. Navathe, PEA
- Database Principles Fundamentals of Design Implementation and Management, Carlos Coronel,
 Steven Morris, Peter Robb, Cengage Learning.
 - 3. Database Management Systems, 3/e, Raghurama Krishnan, Johannes Gehrke, TMII

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc21 cs04/preview

Mapping of	course	outcomes	with	program	outcomes

	PO1	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													
CO2	2				2									
соз	2	1	2											
CO4	3	2	3								Discourage of		2	
COS	2	2												

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & Engg. Annamacnarya Institute of thnology & Sciences, Tirupati-5

Dept.

ANNAMACHARYAINSTITUTEOFTECHNOLOGYANDSCIENCES::TIRUPATI (AUTONOMOUS)

V 11	Semester: I	Branch	Branch of Study: AI & ML					
Year: II COURSECODE	COURSETITLE	L	Т	P	CREDITS			
20APC3304	Object Oriented Programming through Java (Common to : CSE, CIC, AI & ML, AI &	3	0	0	3			
	DS)				L			

COURSE OBJECTIVES:

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

- To understand object oriented programming concepts and apply them in solving Problems.
- To introduce the principles of inheritance and polymorphism and implementation of packages and interfaces.
- To learn java's exception handling mechanism. String Handling Methods.
- To introduce the concepts of multithreading and Collection Framework and internet programming using applets.
- To introduce the design of Graphical User Interface swing controls.

COUSE OUTCOMES:

CO1: Understanding the Syntax, Semantics and features of Java Programming Language.

CO2: To gain knowledge on Object Oriented Programming concepts.

CO3: Raise Exceptions and handle exceptions.

CO4: Analyze the method of creating Multi-threading programs

CO5: Ability to create GUI applications & perform event handling.

Unit-1:

Object Oriented Thinking: History of Java, Java Buzzwords, Overview of OOP CLASSES AND **Objects:** Classes, Objects, Simple Java Program, Methods, Constructors, this Keyword, Garbage Collection, Data Types, Variables, Arrays, Operators, Control Statements Overloading of Methods and Constructors, Parameter Passing, Recursion, String Class and String handling methods.

Unit- 2:

Inheritance: Inheritance Basics, Using Super, Multilevel Hierarchy, Method Overriding, Dynamic Method Dispatch, Abstract Classes, Using final with Inheritance, Object Class.

Packages: Packages. Access Protection, Importing Packages.

Interfaces: Delining an Interface, Implementing Interface, Applying Interface, Variables in Interfaces, Interfaces can be extended.

Unit-3:

Exception Handling: Exception Handling Fundamentals, Exception Types, Uncaught Exceptions, Usingtry and catch, Multiple catch Clauses, Nested try Statements, throw, throws, finally, Java's Built in Exceptions, Creating Own Exception Sub Classes.

Input and Output Operations: I/O basics, reading console input, writing console output, the PrintWriter class, reading and writing files, automatically closing a file.

Generic Programming — Generic classes — generic methods — Bounded Types — Restrictions and Limitations

Unit-4:

Multithreading: Java Thread Model, The Main Thread. Thread Life Cycle, Creating Thread and Multiple Threads. isAlive() and join(). Thread Priorities, Synchronization, Inter thread Communication, Suspending, Resuming and Stopping Threads.

Collection Framework: Collection Overview, Collection Interfaces: The Collection Interface, the List Interface, the Queue Interface, Collection Classes: Array List Class, Linked List Class, String Tokenizer, Scanner

Unit-5:

Applets: Apolet Basics, Life Cycle of an Applet Simple Applet Display Methods, The HTML APPLETtag.

Dept. of Computer Science a Engg Annamacnarya Institute of Incology & Sciences, Tirupati-5 Passing Parameters to Applets.

Swing: Introduction to Swing Model-View-Controller design pattern button, layout management, Swing Components

Text Books:

- 1. Herbert Schildt, Java. The complete reference, TMH 12thEdition, McGraw Hill, 2021
- 2. Cay. S. Horstmann and Gary Cornell Core Java 2, Vol 2, Advanced Features, Pearson Education, 7th Edition, 2004

Reference Books:

- 1. J.Nino and F.A. Hosch, An Introduction to programming and OO design using Java, John Wiley & sons.
- 2. Y. Daniel Liang, Introduction to Java programming, Pearson Education6th Edition
- 3. R.A. Johnson- Thomson, An introduction to Java programming and object oriented application development.
- 4. P. Radha Krishna, Object Oriented Programming through Java, University Press.

Online Learning Resources:

1. .pping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	P06	PO7	PO8	P09	PO10	PO11	PO 12	PSO1	PSO2
COl	3	2			3	1							1	1
CO2	1	1	3				1	1					1	1
CO3	1		3	1	1	-							1	1
CO4	1	2	3				T						1	1
CO5	2	1	2		3		1						1	1

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & Engy Annamacnarya Institute of thnology & Sciences, Tirupati-5

1.1.1. CDS.F. 64

Course Code			T . T	T	n		
20AES0505	20AES0505 Information Technology And Numerical Methods						
Pre-requisite			3	U	U	3	
Course Outs	Basic Computer Knowledge	Semester			I - I		

rse Outcomes (CO):

CO1: Usage of Digital World and Exploring Cyber space

CO2: Explain the needs of hardware and software required for a computation task.

CO3: Peripheral devices, networking and internet concepts

UNIT - I

8 Hrs

INTRODUCTION TO INFORMATION TECHNOLOGY Your Digital World: The Practical User: How Becoming Computer Savvy Benefits You, Information Technology & Your Life: The Future Now, Infotech is All Pervasive: Cell phones, Email, the Internet, & the E-World, The "All-Purpose Machine": The Varieties of Computers, Understanding Your Computer: How Can You Customize (or Build) Your Own PC?, Where Is Information Technology Headed?

THE INTERNET & THE WORLD WIDE WEB Exploring Cyberspace: Connecting to the Internet: Narrowband, Broadband, & Access Providers, How Does the Internet Work? The World Wide Web, Email & Other Ways of Communicating over the Net, The Online Gold Mine: Telephony, Multimedia, Webcasting, Blogs, E-Commerce, & the Social Web, The Intrusive Internet: Snooping, Spamming, Spoofing, Phishing, Pharming, Cookies, & Spyware.

UNIT - II

SOFTWARE Tools for Productivity & Creativity: SOFTWARE: TOOLS FOR PRODUCTIVITY & CREATIVITY, System Software: The Power Behind the Power, The Operating System: What It Does? Other System Software: Device Drivers & Utility Programs, Common Features of the User Interface, Common Operating Systems, Application Software: Getting Started, Word Processing, Spreadsheets, Database Software, Specialty Software HARDWARE: THE CPU & STORAGE How to Choose a Multimedia Computer System: HARDWARE: THE CPU & STORAGE: HOW TO CHOOSE A MULTIMEDIA COMPUTER SYSTEM, Microchips, Miniaturization, & Mobility, the System Unit: The Basics, More on the System Unit, Secondary Storage, Future Developments in Processing & Storage

UNIT - III

HARDWARE: INPUT & OUTPUT Taking Charge of Computing & Communications: Input & Output, Input Hardware, Output Hardware, Input & Output Technology & Quality of Life: Health & Ergonomics, The Future of Input & Output

COMMUNICATIONS, NETWORKS, & SAFEGUARDS The Wired & Wireless World: From the Analog to the Digital Age, Networks, Wired Communications Media, Wireless Communications Media, Cyber Threats, Hackers, & Safeguards

Mapping of course outcomes with program outcomes

	PO1	P02	РОЗ	P04	PO5	P06	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2			2						8-2-5	2	2	
C02	3	3	2						2			2	2	
соз	3	2			. 2							2		

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & Engg Annamacnarya Institute of hnology & Sciences, Tirupati-5

20AES0505 Numerical Methods Pre-requisite **Basic Statistics** Course Outcomes: CO4: Analyze the concepts of Errors, Algebraic & Transcendental Equations to solve different Engineering problems CO5: Analyze Interpolation using the concepts of the numerical methods and apply the Integration in numerical

CO6: Apply the concepts of O.D.E on numerical method

8 Hrs Errors in Numerical computations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.

Solution of Algebraic and Transcendental Equations: The Bisection Method - The Method of False Position-Newton-Raphson Method, Solution of linear simultaneous equation: Crout's triangularisation method, Gauss - Seidal iteration method.

Interpolation: Newton's forward and backward interpolation formulae - Lagrange's formulae. Gauss forward and backward formula, Stirling's formula, Bessel's formula.

Curve fitting: Fitting of a straight line - Second degree curve - Exponential curve-Power curve by method of least squares. Numerical Differentiation for Newton's interpolation formula. Numerical Integration: Trapezoidal rule -Simpson's 1/3 Rule - Simpson's 3/8 Rule.

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method- Runge - Kutta Methods. Numerical solutions of Laplace equation using finite difference approximation. Initial Value Problem, Eigen Value Problem and Boundary-value Problem

Textbooks:

- 1. Using Information Technology 9th Edition By Brian Williams and Stacey Sawyer, Mcgraw Hill Publications
- 2. "Computer Oriented Numerical Methods" by V Rajaraman

Reference Books:

- Uttam K Roy, -Web Technologiesl, Oxford University Press, 1st Edition, 2010.
- 2. HTML and CSS: Design and Build Websites 1st Edition by Jon Duckett (Author) india price
- Steven Holzner, —The Complete Reference PHPI, Tata McGraw-Hill, 1st Edition, 2007.
- 4. HTML & CSS: The Complete Reference, Fifth Edition (Complete Reference Series)
- 5. Deitel and Deitel and Nieto, -Internet and World Wide Web How to Programl, Prentice Hall, 5 th Edition, 2011.
- Numerical Methods by E Balaguruswamy

Online Learning Resources:

- http://www.scoopworld.in
- http://www.sxecw.edu.in
- http://www.technofest2u.blogspot.com
- 4. http://www.ptutorial.com/php-example/php-upload-image
- 5. http://www.ptutorial.com/php-example/php-change-case
- 6. https://www.math.ust.hk/~machas/numerical-methods.pdf

Mapping o	of course	outcome	noo.	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	PO1	PO2	PO3	704	100	- NOTICE								
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Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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Dept. of Computer Science & Engg. Annamacha, a metitute of

thnology & Sciences, Tirupati-5

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High) Course Code C 20AES0501 Problem Solving And Programming 3 0 0 3 Pre-requisite Basic Mathematics Semester I - I Course Objectives: Introduce the internal parts of a computer, and peripherals. Introduce the Concept of Algorithm and use it to solve computational problems ldentify the computational and non-computational problems Teach the syntax and semantics of a C Programming language Demonstrate the use of Control structures of C Programming language Illustrate the methodology for solving Computational problems Course Outcomes (CO): CO1: Able to know interconnection of peripherals and connects of algorithms and flowcharts CO2: Able to know problem solving aspects, design and analysis of algorithm CO3: Able to know flow control, input output and implementation functions CO4: Able to solve computational problems using functions, array and pointers CO5: Able to organise real world heterogeneous data and apply searching ,sorting techniques with exception handling UNIT - I 8 Hrs Computer Fundamentals: What is a Computer, Evolution of Computers, Generations of Computers, Classification of Computers, Anatomy of a Computer, Memory revisited, Introduction to Operating systems, Operational overview of a CPU. Introduction to Programming, Algorithms and Flowcharts: Programs and Programming, Programming languages, Compiler, Interpreter, Loader, Linker, Program execution, Fourth generation languages, Fifth generation languages, Classification of Programming languages, Structured programming concept, Algorithms, Pseudo-code, Flowcharts, Strategy for designing algorithms, Tracing an algorithm to depict logic, Specification for converting algorithms into programs. UNIT - II 9 Hrs Introduction to computer problem solving: Introduction, the problem solving aspect, top-down design, implementation of algorithms, the efficiency of algorithms, and the analysis of algorithms. Fundamental algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, sine function computation, generation of the Fibonacci sequence, reversing the digits of an integer. UNIT - III Types, Operators, and Expressions: Variable names, data types and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, conditional expressions precedence and order of evaluation. Input and output: standard input and output, formatted output-Printf, formatted input-Scanf. Control Flow: Statements and blocks, if-else, else-if, switch, Loops-while and for, Loops-Do- while, break and continue, Goto and labels. Functions and Program Structure: Basics of functions, functions returning non-integers, external variables, scope variables, header variables, register variables, block structure, initialization, recursion, the C processor. UNIT - IV 9 Hrs Factoring methods: Finding the square root of a number, the smallest divisor of a number, the greatest common divisor of two integers, generating prime numbers. Pointers and arrays: Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, pointer array; pointers to pointers, Multi-dimensional arrays, initialization of arrays, pointer vs. multi-dimensional arrays, command line arguments, pointers to functions, complicated declarations. Array Techniques: Array order reversal, finding the maximum number in a set, removal of duplicates from an order array, finding the kin smallest element UNIT - V 9 Hrs Borting and Bearching: Sorting by selection, sorting by exchange, sorting by insertion, sorting by partitioning binary search. Structures: Basics of structures, structures and functions, arrays of structures, pointers to structures, selfreferential structures, table lookup, typedef, unions, bit-fields. Some other Features: Variable-length argument lists, formatted input-Scanf, file access, Error handling-stderr and exit, Line Input and Output, Miscellaneous Functions. Textbooks: 1. Pradip Dey, and Manas Ghosh, "Programming in C", 2018, Oxford University Press. 2. R.G. Dromey, "How to Solve it by Computer". 2014, Pearson. 3. Brian W. Kernighan, and Dennis M. Ritchie, "The C Programming Language", 2nd Edition, Pearson.

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Reference Books:

- 1. RS Bichkar "Programming with C", 2012, Universities Press.
- 2. Pelin Aksoy, and Laura Denardis, "Information Technology in Theory", 2017, Cengage Learning.
- 3. Byron Gottfried and Jitender Kumar Chhabra, "Programming with C", 4th Edition, 2019, McGraw Hill Education.

Online Learning Resources:

www.nptel.ac.in

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	POB	POS	7010		-	3	
01	2	2								-			2	
CO2	3	3	2						-				2	
соз	2	3	3								-		2	
CO4	2	1	3	2					-	-		3	2	2
COS	2	1	3	3	2			2						

(Levels of Correlation, viz., 1-Low, 2-Moderate, 3 High)

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