Marudhar Kesari Jain College for Women (Autonomous)

Vaniyambadi – 635 751

Department of Artificial Intelligence

For

Undergraduate Programme

Bachelor of Science in Artificial Intelligence

From the Academic Year 2025-2026

CONTENT

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK FOR UNDERGRADUATE EDUCATION

Preamble

Bachelor of Computer Science with Artificial Intelligence is a 3 – Year Undergraduate Programme spread over six semesters. The course is designed to achieve a high degree of technical skills in Problem solving and Modern application development. The course develops requisite professional skills and problem solving along with developing the analytical abilities for pursuing a successful career in software industry and forms the required basics for further higher studies in Computer Science specifically in the area of Artificial Intelligence.

PROGRAMME OUTCOMES (PO)

Programme	**B.Sc. Artificial Intelligence**
Programme Code	**US02**
Duration	**3 years [UG]**
Programme Outcomes	**PO1:** Acquire knowledge in Artificial Intelligence to apply the knowledge in their day-to-day life for betterment of self and society. **PO2:** Acquire knowledge in Artificial Intelligence to apply the knowledge in their day-to-day life for betterment of self and society. **PO3:** Develop research related skills in defining the problem, formulate and test the hypothesis, analysis, interpret, and draw conclusion from data. **PO4:** Address and develop solutions for societal and environmental needs of local, regional and national development. **PO5:** Work independently and engage life long learning and enduring proficient progress. **PO6:** Provoke employability and entrepreneurship among students along with ethics and common skills. **PO7:** Understand the importance of ethical behavior in business contexts and be able to recognize and address ethical dilemmas they may encounter in their professional **PO8:** Prepared for lifelong learning and professional development, including the ability to adapt to changes in technology, business practices, and economic conditions throughout their careers.
PROGRAM SPECIFIC OUTCOMES	**PSO1 Artificial Intelligence for Real-World Solutions** Demonstrate the ability to apply Artificial Intelligence and computational techniques to analyze and solve complex real-world problems effectively. **PSO2 Ethical and Professional Practices** Exhibit ethical responsibility in professional practices, ensuring compliance with cyber regulations, laws, and industry standards while designing and developing computing solutions **PSO3 Innovation and Entrepreneurship** Apply innovative thinking and entrepreneurial strategies to develop and implement technology-driven solutions for societal and business challenges.

Eligibility for Admission:

Candidate seeking admission to the first year of the UG Degree Course should have passed the Higher Secondary Course Examination (Academic or Vocational) conducted by the Govt. of Tamilnadu with Mathematics / Business Mathematics / Statistics / Computer Science as a subject or an Examination of any other University accepted as equivalent thereto by the Syndicate subject to such other conditions as may be prescribed. Such candidates shall be permitted to take the B.Sc. Degree Examination of this University after the completion of the Course of three Academic Years in this University / Colleges affiliated to this University and shall qualify for the B.Sc. Degree.

Methods of Evaluation and Assessment

Methods of Evaluation		
Internal Evaluation		25 Marks
External Evaluation	End Semester Examination	75 Marks
	Total	**100 Marks**
Methods of Assessment		
Recall (K1)	Simple definitions, MCQ, Recall steps, Concept definitions	
Understand / Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, short summary or overview	
Application (K3)	Suggest idea/concept with examples, suggest formulae, solve problems, Observe, Explain	
Analyze (K4)	Problem-solving questions, finish a procedure in many steps, Differentiate Between various ideas, Map knowledge	
Evaluate (K5)	Longer essay/Evaluation essay, Critique or justify with pros and cons	
Create (K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations	

Semester – I						
Code	Course Title	Hours Distribution				C
		L	T	P	S	
24UFTA11/ 24UFUR11	Tamil – 1 / Urdu- 1	4	1	0	0	3
24UFEN11	English - 1	4	1	0	0	3
24UAIC11	CC – 1 Programming for Problem Solving	3	1	2	0	5
24UAIC12P	CC - 2 (Practical) Problem Solving using C	0	0	4	0	3
24UMAA12	EC - 1 AL I) Statistical Methods and their Applications - I	3	1	0	0	3
24UAIS11	SEC – 1 NM Office Automation	1	0	1	0	2
24UAIS12	SEC – 2 Internet & Web Development	1	0	1	0	2
24UAIF11	FC Digital Computer Fundamentals	1	1	0	0	2
					30	**23**

Semester - II						
Code	Course Title	Hours Distribution				C
		L	T	P	S	
24UFTA21/ 24UFUR21	Tamil – 2 / Urdu- 2	4	1	0	0	3
24UFEN21	English - 2	4	1	0	0	3
24UAIC21	CC - 3 Python Programming	3	1	2	0	5
24UAIC22P	CC - 4 (Practical) Python Programming Lab	0	0	4	0	2
24UMAA23	EC - 2 AL Statistical Methods and it's Applications-II	3	1	0	0	4
24UMAA23P	EC - 3 AL Statistical Methods and it's Applications –I & II Practical's	0	0	2	0	2
24UAIS21	SEC - 3 PHP Programming	1	0	1	0	2
24UAEC21	AEC – 1 Life Skill For Yoga	1	1	0	0	2
					30	**23**

Semester – III						
24UFTA31	Tamil - 3	4	1	0	0	3
24UFEN31	English - 3	4	1	0	0	3
24UAIC31	CC – 5 Artificial Intelligence	3	1	2	0	5
24UAIC32P	CC - 6 Practical -III Artificial Intelligence Lab	0	0	4	0	2
24UAIA31 24UAIA32	EC - 4 1. Relational Database Management Systems 2. Mobile Application Development	3	1	0	0	4
24UAIA33P 24UAIA34P	EC - 5 1. RDBMS Lab 2. Mobile Application Development Lab	1	0	1	0	2
24UAIS31	SEC -4 Data Communication and Network	2	0	0	0	2
24UAEC31	AEC – 2 Human Values and Professional Ethics	1	1	0	0	2
					30	**23**

Semester - IV						
	Tamil - 4	4	1	0	0	3
	English - 4	4	1	0	0	3
	CC – 7 R Programming	3	1	2	0	5
	CC - 8 (Practical) - R Programming Lab	0	0	4	0	2
	EC - 6 1. Introduction to fuzzy Logic 2. Robotics and its Applications	3	1	0	0	4
	EC - 7 1. IOT and its Applications Lab 2.Software Testing	1	0	1	0	2
	SEC – 5 Cloud Computing	1	0	1	0	2
	AEC – 3 ENVIRONMENTAL STUDIES	1	1	0	0	2
					30	**23**

Semester – V						
	CC -9 Operating System	4	1	0	0	4
	CC- 10 Machine Learning	0	0	4	0	4
	CC – 11 Operating System lab	2	1	1	0	4
	CC – 12 Machine Learning Lab	0	0	3	0	2
	EC – 8 i) Natural Language Processing, ii) Cryptography	4	1	0	0	4
	EC – 9 i) Simulation and Modeling, ii) Artificial Neural Networks	4	1	0	0	4
	AEC – 4 Social Responsibilities and Upliftment	1	1	0	0	2
	Internship				2	2
					30	**26**

Semester - VI						
	CC – 13 – Tensor Flow	4	1	0	0	4
	CC - 14 Practical – Tensor Flow Lab	0	0	5	0	3
	CC - 15 - Project	0	0	0	5	4
	EC – 10 i) Data Visualization (TABLEAU) ii) Introduction to Data Science	4	1	0	0	4
	EC – 11 i) Big Data Analytics iii) Virtual Reality Technology	4	1	0	0	4
	PEC – 1 Ethical Hacking	1	1	0	0	2
	SLC – 1 Extension Activity				3	2
					30	**23**
					141+2*	

Students must complete at least one online course (MOOC) from platforms like SWAYAM, NPTEL, or Nanmudalvan within the fifth semester. Additionally, engaging in a specified Self-learning Course is mandatory to qualify for the degree, and successful participation will be acknowledged with an extra credit of 2*.

Part – 1 & 2	Tamil & English	8	SEC	Skill Elective Course	5
CC	Core Course	15	FC	Foundation Course	1
EC-AL	Elective Course – Applied	7	AEC	Ability Enhancement Course	4
EC	Elective Course - Major	4	SLC	Self-Learning Course	1

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIC31	**Artificial Intelligence**	**CC- 5**	3	1	2	0	5	6	**25**	**75**	**100**

Learning Objectives	
LO1	To describe the concepts of Artificial Intelligence
LO2	To Understand the method of solving problems using Artificial Intelligence
LO3	To study the Knowledge Representation
LO4	To comprehend the concept of Software Agents
LO5	To study various AI applications

Unit	Content	Hours
1	**INTRODUCTION:** Introduction–Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents– Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.	18
2	**PROBLEM SOLVING METHODS** Problem solving Methods – Search Strategies- Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems – Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search – Game Playing – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games	18
3	**KNOWLEDGE REPRESENTATION** First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining-Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering-Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories – Reasoning with Default Information	18
4	**SOFTWARE AGENTS** Architecture for Intelligent Agents – Agent communication– Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems.	18
5	**APPLICATIONS** AI applications – Language Models – Information Retrieval-Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving	18

CO	Course Outcomes The student will be able to
CO1	Explain the basics of the theory and practice of Artificial Intelligence as a discipline and about intelligent agents.
CO2	To describe search techniques and gaming theory
CO3	The student will learn to apply knowledge representation techniques and problem solving strategies to common AI applications.
CO4	Examine the architecture and argumentation among software agents
CO5	Illustrate the basics of pattern recognition and steps required for it.
Textbooks:	
1	Elaine Rich, Kevin Knight (2008), Shivsankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Publication
2	P.Rizwan Ahmed, Artificial Intelligence, Margham Publications, Chennai, 2012
Reference Books:	
1	Russel S, Norvig P (2010), Artificial Intelligence : A Modern approach,Third Edition, Pearson Education
2	Dan W Patterson (2007), Introduction to Artificial Intelligence and Expert System, Second Edition, Pearson Education Inc.
3	Jones M(2006), Artificial Intelligence application Programming, Second Edition, Dreamtech Press
4	Nilsson (2000), Artificial Intelligence : A new synthesis, Nils J Harcourt Asia Pvt Ltd.
Web resources:	
1	WWW.GeeksforGeeks
2	https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SECA3011.pdf

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	2	3	3	3
CO3	3	3	2	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3
Total	15	14	14	15	15	15	15	14	14	15	15
Average	3	2.8	2.8	3	3	3	3	2.8	2.8	3	3

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIC32P	Artificial Intelligence Lab	CC-6	0	0	4	0	2	4	25	75	100

Learning Objectives	
LO1	To understand the potential benefits of using AI in knowledge-sharing and management
LO2	To Learn automation of knowledge management tasks using AI Tools
LO3	To study how AI is role in data analysis and decision-making
LO4	To explore ways to integrate AI applications into existing knowledge management systems
LO5	To Integrate AI with existing knowledge management systems

Unit	Content	Hours
	1. Write a python program to implement Breadth First Search Traversal? 2. Write a python program to implement Water Jug Problem? 3. Write a python program to remove punctuations from the given string? 4. Write a python program to sort the sentence in alphabetical order? 5. Write a program to implement Hangman game using python. 6. Write a program to implement Tic-Tac-Toe game using python. 7. Write a python program to remove stop words for a given passage from a text file using NLTK? 8. Write a python program to implement stemming for a given sentence using NLTK? 9. Write a python program to POS (Parts of Speech) tagging for the give sentence using NLTK? 10. Write a python program to implement Lemmatization using NLTK? 11. Write a python program to for Text Classification for the give sentence using NLTK	60

CO	Course Outcomes The student will be able to
CO1	Implement python code to understand the concept of AI
CO2	Implement different AI Techniques
CO3	Application of AI techniques in practical Life
CO4	Use of Natural Language Tool Kit in Python
CO5	Demonstrate integration of NLTK with Python code
Textbooks:	
1	Elaine Rich, Kevin Knight (2008), Shivsankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Publication
2	P.Rizwan Ahmed, Artificial Intelligence, Margham Publications, Chennai, 2012
Reference Books:	
1	Russel S, Norvig P (2010), Artificial Intelligence : A Modern approach,Third Edition, Pearson Education
2	Dan W Patterson (2007), Introduction to Artificial Intelligence and Expert System, Second Edition, Pearson Education Inc.
3	Jones M(2006), Artificial Intelligence application Programming, Second Edition, Dreamtech Press
4	Nilsson (2000), Artificial Intelligence : A new synthesis, Nils J Harcourt Asia Pvt Ltd.
Web resources:	
1	WWW.GeeksforGeeks
2	www.w3c schools.com

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	2	2	3	3	3	3	2	2
CO3	2	2	1	3	3	3	2	2	1	3	3
CO4	3	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3	3
Total	14	14	13	14	14	12	14	14	13	14	14
Average	2.8	2.8	2.6	2.8	2.8	2.4	2.8	2.8	2.6	2.8	2.8

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIA31	Relational Database Management Systems	EC-4	3	1	0	0	4	4	25	75	100

Learning Objectives	
LO1	To understand the basic concepts in the design and implementation of a database system.
LO2	To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.
LO3	To understand and use data manipulation language to query, update, and manage a database
LO4	To develop an understanding of essential DBMS concepts such as: PL/SQL
LO5	To understand exception handling while building a simple database system

Unit	Content	Hours
1	**Introduction:** Database System-Characteristics of Database Management Systems- Architecture of Database Management Systems-Database Models-System Development Life Cycle-Entity Relationship Model.	12
2	**Relational Database Model:** Structure of Relational Model-Types of keys. Relational Algebra: Unary operations-Set operations-Join operations. Normalization: Functional Dependency- First Normal form-Second Normal Form-Third Normal form- Boyce-Codd Normal Form-Fourth Normal Form.	12
3	**SQL:** Introduction. Data Definition Language: Create, alter, drop, rename and truncate statements. Data Manipulation Language: Insert, Update and Delete Statements. Data Retrieval Language: Select statement. Transaction Control Language: Commit, Rollback and Savepoint statements. Single row functions using dual: Date, Numeric and Character functions. Group/Aggregate functions: count, max, min, avg and sum functions. Set Functions: Union, union all, intersect and minus. Subquery: Scalar, Multiple and Correlated subquery. Joins: Inner and Outer joins.Defining	12
4	**PL/SQL:** Introduction-PL/SQL Basic-Character Set- PL/SQL Structure-SQL Cursor-Subprograms-Functions-Procedures.	12
5	**Exception Handling:** Introduction-Predefined Exception-User Defined Exception-Triggers-Implicit and Explicit Cursors-Loops in Explicit Cursor.	12

CO	Course Outcomes The student will be able to
CO1	Demonstrate the characteristics of Database Management Systems and the basic concepts and models of database.
CO2	Classify the keys and the concepts of Relational Algebra and explain the applications of various Normal Forms Classification of Dependency.
CO3	Elaborate the different types of Functions and Joins and their applications. Introduction of Views, Sequence, Index and Procedure.
CO4	Demonstrate the Representation of PL-SQL Structure and implement Sub Programs, Functions and Procedures.
CO5	Demonstrate the handling of Exception and Pre-Defined Exception. And appreciate importance of Triggers, Implicit and Explicit Cursors..
Textbooks:	
1	Pranab Kumar Das Gupta and P. Radha Krishnan, "Database Management System Oracle SQL and PL/SQL", Second Edition, 2013, PHI Learning Private Limited.
2	P.Rizwan Ahmed, RDBMS and Oracle, Margham Publications, Chennai. 2018
3	A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", fifth Edition McGraw-Hill , Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.
Reference Books:	
1	RamezElmasri and Shamkant B. Navathe, "*Fundamentals of Database Systems*", Seventh Edition, Pearson Publications.
2	Abraham Silberschatz, Henry Korth, S. Sudarshan, "*Database System Concepts*", Seventh Edition, TMH.
Web resources:	
1	https://www.geeksforgeeks.org/dbms/dbms/

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3	3
CO4	2	3	3	3	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3
Total	14	15	15	14	15	14	14	15	15	14	15
Average	2.8	3	3	2.8	3	2.8	2.8	3	3	2.8	3

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIA32	Mobile Application Development	EC-4	3	1	0	0	4	4	25	75	100

Learning Objectives	
LO1	To understand the basics of smart phones and android platforms.
LO2	To Study the basic concepts of user interface related to app development.
LO3	To learn the importance of data persistence in mobile environment.
LO4	To understand the various services and network facilities provided by android platform.
LO5	To Comprehend the various apps deployed and developed on by mobile platform.

Unit	Content	Hours
1	**INTRODUCTION TO ANDROID PLATFORM** -Introduction to Mobile Application Development – Various platforms – Smart phones – Android platform: features – Architecture – Versions – ART (Android Runtime) – ADB (Android Debug Bridge) – Development environment/IDE: Android studio and its working environment – Emulator setup– Application frame work basics XML representation and Android manifest file– Creating a simple application.	12
2	**ANDROID UI DESIGN-** GUI for Android: activities lifecycle – Android v7 support library – Intent: Intent object – Intentfilters–Adding categories–Linking activities–User Interface design components –Basic Views – Picker Views – List View – Specialized Fragment – Gallery and Image View – Image Switcher – Grid View, Options Menu– Context Menu – Clock View –Web view– Recycler View	12
3	**DATA PERSISTENCE -**Different Data Persistence schemes: Shared preferences – File Handling – Managing data using SQLite database –Content providers: user content provider – Android in build content providers.	12
4	**ANDROID SERVICES & NETWORK ENVIRONMENT-**Services: Introduction to services–Local service–Remote service–Binding the service–Communication between service and activity – Intent Service – Multi–Threading: Handlers – Async Task– Android network programming: Http Url Connection–Connecting to REST–based – SOAP based Web services – Broad cast receivers: Local Broad cast Manager– Dynamic broad cast receiver– System Broadcast–Telephony Manager: Sending SMS and making calls.	12
5	**ADVANCED APPLICATIONS-**Location based services: Google maps V2 services using Google API – Animations and Graphics: Property Animation–View Animations–Draw able Animations– Media and Camera API: Working with video and audio inputs – camera API – Sensor programming: Motion sensors –Position sensors – Environmental sensors – Publishing Android Apps: Guide lines – policies and process of uploading Apps to Google play.	12

CO	Course Outcomes The student will be able to
CO1	Explain the basics of android applications
CO2	Describe the role of GUI for android.
CO3	To examine the importance of data persistence in mobile environment
CO4	Explain the various series of android services
CO5	Develop simple mobile application using android
Textbooks:	
1	"Head First: Android Development", Dawn Griffiths, David Griffiths, OReilly, 1st Edition,2015.
2	Barry Burd, "Android Application Development – All–in–one for Dummies", 2nd Edition,WileyIndia,2016.
Reference Books:	
1	"Professional Android™ Sensor Programming", Greg Milette,Adam Stroud, John WileyandSons,Inc2012.
2	"Android6forProgrammers,AppDrivenapproach",PaulDeital,HarveyDeital,AlexanderWald, PrenticeHall,2015.
Web resources:	
1	https://www.w3schools.com
2	https://www.javatpoint.com/r-tutorial
3	https://www.tutorialspoint.com/r/index.htm

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	2	3	2	3	2	2	2	2	3
CO2	3	3	2	3	2	3	2	3	3	3	2
CO3	3	3	2	3	3	2	2	3	3	3	2
CO4	3	3	2	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	2	3	3	3	2
Total	15	15	10	15	13	14	11	14	14	14	12
Average	3	3	2	3	3	3	2.2	3	3	3	2

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIA33P	RDBMS LAB	EC-5	1	0	1	0	2	2	25	75	100

Learning Objectives	
LO1	To understand the concepts of DDL/DML/DCL/TCL commands.
LO2	To understand the concepts of Join queries.
LO3	To understand the concepts of exception handling.
LO4	To understand the concepts of cursors.
LO5	To understand the concepts of packages.

Unit	Content	Hours
	1. Execute a single line query and group functions. 2. Execute DDL Commands. 3. Execute DML Commands 4. Execute DCL and TCL Commands. 5. Implement the Nested Queries. 6. Implement Join operations in SQL 7. Create views for a particular table 8. Implement Locks fora particular table. 9. Develop a PL/SQL procedure for an application using exception handling. 10. Develop a PL/SQL procedure for an application using cursors. 11. Develop a PL/SQL procedure for an application using functions 12. Develop a PL/SQL procedure for an application using package	30

CO	Course Outcomes Students will be able to
CO1	Design and Implement a database schema for a given problem domain..
CO2	Populate and Query a database using SQL DDL/DML Commands
CO3	Build well formed in String Date/Aggregate Functions
CO4	Design and Implement a database query using Joins,Sub-Queries and Set Operations.
CO5	Program in SQL including Objects (Functions, Procedures, Triggers)
Textbooks:	
1	Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition
2	Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016
Reference Books:	
1	Abraham Silberschatz, Henry F.Korth and S.Sudarshan,“Database System Concepts”, McGraw Hill International Publication ,VI Edition
2	Shio Kumar Singh , “Database Systems “,Pearson publications ,II Edition
Web resources:	
1	Web resources from NDL Library, E-content from open-source libraries

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	2	3	2	3	2	2	2	2	3
CO2	3	3	2	3	2	3	2	3	3	3	2
CO3	3	3	2	3	3	2	2	3	3	3	2
CO4	3	3	2	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	2	3	3	3	2
Total	15	15	10	15	13	14	11	14	14	14	12
Average	3	3	2	3	3	3	2.2	3	3	3	2

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIA34P	Mobile Applications Development Lab	EC-5	1	0	1	0	2	2	25	75	100

Learning Objectives	
LO1	To understand how to change fonts.
LO2	To understand how to change colors.
LO3	To know about layout managers.
LO4	To understand drawing methods.
LO5	To understand database connectivity.

Unit	Content	Hours
	1. Develop an application that uses GUI components, Font and Colors. 2. Develop an application that uses Intent and Activity. 3. Develop an application that uses Layout Managers and event listeners. 4. Write an application that draws basic graphical primitives on the screen. 5. Develop an application that makes use of RSS Feed. 6. Implement an application that implements Multi-threading. 7. Develop an application that create alarm clock. 8. Develop an application Using Widgets. 9. Implement an application that writes data to the SDcard. 10. Implement an application that creates an alert upon receiving a message. 11. Develop an application that makes use of database.	30

CO	Course Outcomes The student will be able to
CO1	To understand android basics
CO2	To gain knowledge of GUI for android.
CO3	To understand SQLite database
CO4	To understand android services
CO5	To develop simple mobile application using android
Textbooks:	
1	"Head First: Android Development", Dawn Griffiths, David Griffiths, OReilly, 1st Edition, 2015.
2	Barry Burd, "Android Application Development – All–in–one for Dummies", 2nd Edition, Wiley India,2016.
Reference Books:	
1	"Professional Android™ Sensor Programming", Greg Milette, Adam Stroud, John WileyandSons,Inc2012.
2	"Android6forProgrammers,App Driven approach",PaulDeital,HarveyDeital,AlexanderWald, PrenticeHall,2015.
Web resources:	
1	https://www.w3schools.com/
2	https://www.javatpoint.com/r-tutorial
3	https://www.tutorialspoint.com/r/index.htm

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	2	3	2	3	2	2	2	2	3
CO2	3	3	2	3	2	3	2	3	3	3	2
CO3	3	3	2	3	3	2	2	3	3	3	2
CO4	3	3	2	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	2	3	3	3	2
Total	15	15	10	15	13	14	11	14	14	14	12
Average	3	3	2	3	3	3	2.2	3	3	3	2

3 – Strong, 2- Medium, 1- Low

2nd YEAR: THIRD SEMESTER

Course Code	Course Name	Category	L	T	P	S	Credits	Hours	Marks		
									CIA	External	Total
24UAIS31	**Data Communication And Network**	**SEC-4**	2	0	0	0	2	2	25	75	100

Learning Objectives	
LO1	To introduce the fundamental network architecture concepts and their core principle issues in the emerging communication / data networks.
LO2	To have a complete picture of the data and computer networks systematically
LO3	To provide a strong foundation in networking concepts and technology
LO4	To know the significance of various Flow control and Congestion control Mechanisms
LO5	To know the Functioning of various Application layer Protocols.

Unit	Content	Hours
1	**Data Communications**: Introduction– Networks – The Internet – Protocols and Standards- Network Models: OSI model – TCP/IP protocol suite – Transmission Media: Guided media – Unguided Media.	6
2	**Data Link Layer:** Error Detection and Correction: Introduction- Block coding – Linear block codes – Cyclic Codes – Checksum. Framing – Flow and Error Control: Protocols –Noiseless Channels: Stop- and –Wait – Noisy Channel: Stop- and Wait Automatic Repeat Request-Go-Back –N.	6
3	**Medium Access and Network Layer:** Multiple Access: Random Access – Controlled access- Channelization. Network Layer Logical addressing: IPv4 addresses – IPv6 addresses. Transport Layer: Process to Process delivery: UDP – TCP. Congestion Control – Quality of Service	6
4	**Application Layer:** Domain Naming System: Name Space - Domain Name Space - Distribution of Name Space - DNS in the INTERNET - Resolution– Remote logging – E-mail – FTP.	6
5	**Wireless Networks**: Wireless Communications – Principles and Fundamentals. WLANs – WPAN- Satellite Networks - Ad-hoc Networks	6

CO	Course Outcomes The student will be able to
CO1	Understand the basics of data communication, networking, internet and their importance.
CO2	Analyze the services and features of various protocol layers in data networks.
CO3	Differentiate wired and wireless computer networks
CO4	Analyze TCP/IP and their protocols.
CO5	Recognize the different internet devices and their functions.
Textbooks:	
1	Forouzan, A. Behrouz. (2006), Data Communications & Networking, Fourth Edition, Tata McGraw Hill Education
2	Nicopolitidis, Petros, Mohammad SalamehObaidat, G. L. Papadimitriou(2018), Wireless Networks, John Wiley & Sons.
Reference Books:	
1	Fred Halsall(1996), Data Communications Computer Networks and Open Systems, Fourth Edition, Addison Wesley.
Web resources:	
1	https://www.tutorialspoint.com/data_communication_computer_network/index.htm
2	https://www.geeksforgeeks.org/data-communication-definition-components-types-channels/

Mapping with Programme Outcomes and Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3
CO2	2	3	3	3	2	3	2	3	3	3	2
CO3	3	3	3	3	2	2	3	3	3	3	2
CO4	3	3	3	3	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3	3
Total	14	15	15	15	13	14	14	15	15	15	13
Average	2.8	3	3	3	2.6	2.8	2.8	3	3	3	2.6

3 – Strong, 2- Medium, 1- Low