

FIFTH SEMESTER

ERA UNIVERSITY
Department of Computer Science
Course Outline
Academic Year: 2026-27

Programme: Bachelor of Computer Application		Year: III		Semester: V	
Course Name: Application Development using C#.NET		Course Code: B030501T			
Core/Elective/ Co-curricular/ Vocational:					
Credits: 03	Total No. of Lectures: 45 Lecture-Tutorial-Practical (in hours/week) L-T-P: 3-0-0				
Evaluation Spread	Internal Continuous		25	End Term Exam	75
Course Objective	1. To understand the architecture and components of the .NET Framework and develop applications. 2. To apply programming concepts such as control statements, methods, arrays, exception handling, delegates, and multithreading in software development. 3. To implement OOP concepts including inheritance, polymorphism, abstraction, using C#. 4. To develop Windows, Web, MVC, and database-driven applications using ASP.NET, ADO.NET, and Entity Framework.				
Course Outcome	CO1: Understand .NET Framework, C# syntax, data types, control statements, and methods. CO2: Apply object-oriented programming concepts, arrays, strings, exception handling, delegates, and multithreading in C#. CO3: Develop Windows and Web applications using Windows Forms and ASP.NET technologies. CO4: Design database-driven and MVC-based applications using ADO.NET, Entity Framework, and CRUD operations.				
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities				
Internal Evaluation Mode	Mid-term Examination: 10 Marks Quiz/Test: 05Marks Assignment: 05 Marks Presentation: 05 Marks				
UNITS	Topic				No. of Lectures
I	Introduction to .NET Technology, Origin and Evolution of .NET, Features of .NET Framework, .NET Framework Architecture, Common Language Runtime (CLR), Common Type System (CTS), Common Language Specification (CLS), Intermediate Language, Just-In-Time (JIT), Garbage Collection, Assemblies, Introduction to Visual Studio IDE.				4
II	Introduction to C#, Structure of C# Program, Compilation and Execution Process, Tokens in C#, Identifiers and Keywords, Variables and Constants, Data Types, Type Conversion and Casting, Operators in C#, Console Input and Output, Comments in C#.				6

III	Decision Making Statements, if, if-else, nested if, switch Statement, Looping Statements, for Loop, while Loop, do-while Loop, foreach Loop, break, continue, Methods in C#, Parameter Passing Techniques: ref, out and params Keywords.	5
IV	Introduction to OOP, Classes and Objects, Constructors, Encapsulation, Inheritance,	5
V	Polymorphism: Compile-time and Run-time Polymorphism, Method Overriding, Abstraction: Interfaces, Abstract Classes, Static Members.	5
VI	Arrays, String Class, String Methods, Boxing and Unboxing, Exception Handling, try, catch, finally, throw, User Defined Exceptions, Delegates.	5
VII	Introduction to Windows Forms, Controls and Components, Event Handling, MenuStrip, Dialog Boxes, Life Cycle of Windows Applications, Introduction to ASP.NET, Web Forms Architecture, Web Forms Controls, Validation Controls, C# in Web Applications.	7
VIII	Introduction to ADO.NET, ADO.NET Architecture, Data Providers, Connection Object, Command Object, DataReader, DataAdapter, DataSet, Connected and Disconnected Architecture.	8

Suggested Readings:

Books:

1. Pro C# 9 with .NET 5, Apress Publications. Recommended for advanced C# and .NET concepts.
2. Pro ASP.NET MVC 5, Apress Publications.
3. Head First C#, O'Reilly Media

E-learning:

1. <https://www.w3schools.com/cs/index.php>
2. <https://www.tpointtech.com/c-sharp-tutorial>

UNITS	MAPPED CO
I	CO1
II	CO1
III	CO1, CO2
IV	CO2, CO3
V	CO2, CO3
VI	CO2, CO3
VII	CO2, CO3
VIII	CO3, CO4

MAPPED CO's WITH PO's & PSO's

Mapped CO's with PO's and PSO's												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓

Course created by:
Signature:

Approved by:
Signature:

Programme: Bachelor of Computer Application			Year: III	Semester: V
Course Name: Application Development using C# .NET Lab		Course Code: B030507P		
Co-curricular/Vocational/Core/Elective: Core				
Credits: 1	Total No. of Lectures: 30 Lecture-Tutorial-Practical (in hours/week) L-T-P: 0-0-2			
Evaluation Spread	Internal Continuous	15	End Term Exam	35
Course Objective	• To understand the fundamentals of .NET Framework and C# programming concepts for software development. • To learn programming techniques including arrays, strings, and exception handling in C# • To implement object-oriented programming concepts • To develop Windows, Web, MVC, and database-driven applications using ASP.NET, ADO.NET, and Entity Framework.			
Course Outcome	CO1: Understand .NET Framework fundamentals, C# syntax, data types, operators, functions, and control statements for problem solving. CO2: Apply object-oriented programming concepts & advanced C# features CO3: Develop Windows Forms and ASP.NET web applications using controls, validation & event handling. CO4: Design and implement database-driven and MVC-based applications using ADO.NET, Entity Framework, and CRUD operations.			
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities			
Internal Evaluation Mode	Mid-term Practical Examination: 08 Marks Viva-Voce: 04 Marks Practical File: 03 Marks			
UNIT	Topic			No. of Lectures
I	• Write a program to perform implicit and explicit type conversion. • Write a program to demonstrate boxing and unboxing in C#. • Write a program to display command-line arguments in C#.			3
II	• Write a program to perform arithmetic operations using operators. • Write a program to print sum of digits in a given number • Write a program to check whether a given is perfect or not • Write a program to check whether a given is palindrome or not			4
III	• Write a program to generate Armstrong number up to 10000. • Write a program to create a class and object for student details. • Write a program to demonstrate method overloading in C#. • Write a program to demonstrate method overriding in C#.			4
IV	• Write a program to demonstrate constructor overloading. • Write a program to implement inheritance in C#. • Write a program to implement abstraction using abstract class or interface.			4
V	• Write a program to perform matrix addition, transpose using arrays. • Write a program to perform string manipulation functions. • Write a program to demonstrate exception handling using try-catch-finally. • Write a program to create and handle a user-defined exception.			4
VI	• Create a Windows Form application for student registration.			4

	- Create a Windows Form application with MenuStrip and Dialog Box controls. - Develop an ASP.NET Web Form for login validation. - Create a web application to perform arithmetic operations. - Develop a web form using validation controls.	
VII	- Write a program to establish database connectivity using ADO.NET. - Write a program to insert records into a database table. - Write a program to display records using DataReader. - Write a program to update and delete records from a database table.	4
VIII	- Create a simple MVC application with Model, View, and Controller. - Develop an MVC application to perform CRUD operations. - Create a registration form using MVC and Entity Framework.	3

Suggested Readings:

Books:

- Head First C#, O'Reilly Media
- Pro C# 10 with .NET 6: Foundational Principles and Practices in Programming
- The Complete REFERENCE BOOKS: C#

E-learning:

- <https://www.w3schools.com/cs/index.php>
- <https://www.tpointtech.com/c-sharp-tutorial>

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I	CO1
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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓

Course created by:
Signature:

Approved by:

Signature:

Programme: Bachelor of Computer Application		Year: III		Semester: V	
Course Name: Essential of Python Programming		Course Code: B030502T			
Core/Elective/ Co-curricular/ Vocational: Core					
Credits: 3	Total No. of Lectures: 45 Lecture-Tutorial-Practical (in hours/week) L-T-P: 3-0-0				
Evaluation Spread	Internal Continuous	25	End Term Exam		75
Course Objective	1. To introduce the basic concepts of Python programming language. 2. To make students familiar with the algorithmic approach of problem solving in Python language. 3. To solve real world problems by applying the Python Data Structures, Objects, Functions and Modules. 4. To declare and define functions in Python and build practical applications in Python.				
Course Outcome	CO1: Understand the basic concepts of Python programming language and able to identify the need and use of programming in real world. CO2: Design and develop programs in Python language to solve common problems using concept of Data types such as lists, tuples, and dictionaries.. CO3: Define and use Python functions, modules, and packages. CO4: Design and develop programs utilizing advance C programming concepts like structure, union etc.				
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities				
Internal Evaluation Mode	Mid-term Examination: 10 Marks Quiz/Test: 05Marks Assignment: 05 Marks Presentation: 05 Marks				
UNIT	Topic				No. of Lectures
I	Introduction to Python: Introduction, IDE, Installation Process, Python Indentation, Garbage Collection, Memory Management. Elements of Python: Variables (Identifiers), Datatypes, Keywords. Python Input and Output functions. Type function.				5
II	Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Membership Operator, Identity Operator.				5
III	Conditional Statements: if, if-else, if-elif-else, nested if expression; Looping Statements: range(), for loop, while loop, Nested loop statement; Loop Control Statements: break, continue, and pass. Match Case Statement;				6
IV	Data Structure: String: Types, Indexing, Slicing, Methods, Formatting, Traversing, List: Indexing, Slicing, Methods, Traversing, Comprehension. Tuple: Traversing & Methods, Set Traversing & Methods and Dictionary: Comprehension, Traversing and Methods.				6

V	Defining Function- Declaration, definition and calling of functions. Function Arguments: Required arguments-Keyword arguments-Default arguments-Variable length arguments, Recursion, Lambda function.	6
VI	Object Oriented Programming: Classes and Objects; Creating Classes and Objects; Constructor Method; Inheritance: Types, Encapsulation: Types, Polymorphism: Types.	5
VII	Introduction of Numpy: Narray, Finding the size of each array element, Checking the data type. Array Attributes: Shape, Size, Dimension. Reshaping Arrays, Mathematical Operations on Arrays, Numpy Functions: Mean, Median, Standard Deviation, percentile(), sqrt(), round(), ptp(), min(), max(), amin(), amax()	6
VIII	Introduction to Data Visualization: Matplotlib, Creating Basic Plots: Line Chart, Bar Chart, Pie Chart, Histogram, Scatter Plot. Customizing Graphs: Titles, Labels, Legends, Colors and Styles.	6
Suggested Readings: 1. Core Python Programming – Dr. R. Nageswara Rao. 2. NumPy Beginner's Guide – Ivan Idris 3. Data Visualization with Python and Matplotlib – Ben Fry 4. Python Official Documentation: https://docs.python.org/3/ 5. Numpy documentation: https://numpy.org/doc/ 6. Matplotlib documentation: https://matplotlib.org/stable/users/index.html		

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I	CO1
II	CO1
III	CO1, CO2
IV	CO2,CO3
V	CO2,CO3
VI	CO2,CO3
VII	CO2,CO3
VIII	CO3, CO4

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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓

Course created by:
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Approved by:

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Programme: Bachelor of Computer Application		Year: III		Semester: V	
Course Name: Essential of Python Programming Lab		Course Code: B030508P			
Co-curricular/Vocational/Core/Elective: Core					
Credits: 1	Total No. of Lectures: 30 Lecture-Tutorial-Practical (in hours/week) L-T-P: 0-0-2				
Evaluation Spread	Internal Continuous	15	End Term Exam		35
Course Objective	1. To introduce the basic concepts of Python programming language. 2. To make students familiar with the algorithmic approach of problem solving in Python language. 3. To solve real world problems by applying the Python Data Structures, Objects, Functions and Modules. 4. To declare and define functions in Python and build practical applications in Python.				
Course Outcome	CO1: Create programs to exhibit basic data types, variables, and arithmetic operations using the Python Language. CO2: Design and develop programs in Python language to solve common problems using concept of Data types such as lists, tuples, and dictionaries. CO3: Demonstrate the concept of functions, and object oriented programming using python programs. CO4: Implement python programs using numpy and matplotlib.				
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities				
Internal Evaluation Mode	Mid-term Practical Examination: 08 Marks Viva-Voce: 04 Marks Practical File: 03 Marks				
UNIT	Topic				No. of Lectures
I	1. Write a program to display “Hello World”. 2. Perform arithmetic operations using operators. 3. Write programs for input and output operations. 4. Demonstrate type conversion in Python. 5. Write programs using different data types.				4
II	1. Write a Python program to print the corresponding Fahrenheit to Celsius and Celsius to Fahrenheit. 2. Write Python program to find factorial of an integer. 3. Write Python program to check whether the given string is palindrome or not.				3
III	1. Write a python program that accepts age of three persons and finds the maximum of three. 2. Write Python program to find whether the given integer is: A prime number. 3. Write a program in Python to check if a given number is even or odd. 4. Write a Python program to demonstrate the use of while and do while loop. 5. Write a Python program to demonstrate for loop. 6. Write a Python program to demonstrate the loop control statement continue, pass and break.				4

IV	1. Write C program to find sum and average of n integers using linear array. 2. Write a program in C to store elements in an array and print them. 3. Write a program in C to find the maximum and minimum elements in an array. 4. Write a program in C to copy the elements of one array into another array. 5. Write a program in C to print all unique elements in an array. 6. Write a program in C to separate odd and even integers into separate arrays. 7. Write a program in C to sort the elements of the array in descending order.	4
V	1. Write a program in C to find the square of any number using the function. 2. Write a program in C to swap two numbers using a function. 3. Write a program in C to check if a given number is even or odd using the function. 4. Write a program in C to check whether a number is a prime number or not using the function. 5. Write a program in C to get the largest element of an array using the function. 6. Write C program to find factorial of n by recursion using user defined functions.	4
VI	1. Write a program in C to show the basic declaration of a pointer. 2. Write a program in C to demonstrate how to handle pointers in a program. 3. Write a program in C to demonstrate the use of the &(address of) and *(value at address) operators. 4. Write a program in C to add numbers using call by reference. 5. Write a program in C to store n elements in an array and print the elements using a pointer. 6. Write a program in C to demonstrate the difference between call by value and call by reference.	4
VII	1. Create two array of size (3, 3) and print their sum and multiplication. 2. Create an array of size 10 and calculate square root and standard deviation. 3. Print size and dimension of above arrays. 4. Create an array of size (3, 4) and reshape to (4, 3). 5. Create an empty array of size (3, 3). 6. Round the array of 10 elements by 2 decimal places. 7. Create an array of (4,4). A. Find the maximum element for each row and column. B. Find the minimum elements for each row and column. 8. Print 10th, 30th, 60th, 75th and 90th percentile for each columns of above array.	4
VIII	1. Create line charts using Matplotlib. 2. Draw bar charts and pie charts. 3. Create histograms and scatter plots. 4. Customize graphs using labels and legends. 5. Create statistical plots using Seaborn. 6. Visualize NumPy array data using graphs.	3

Suggested Readings:

1. Core Python Programming – Dr. R. Nageswara Rao.
2. NumPy Beginner's Guide – Ivan Idris
3. Data Visualization with Python and Matplotlib – Ben Fry
4. Python Official Documentation: <https://docs.python.org/3/>
5. Numpy documentation: <https://numpy.org/doc/>
6. Matplotlib documentation: <https://matplotlib.org/stable/users/index.html>

UNITS	MAPPED CO
I	CO1
II	CO1
III	CO1, CO2
IV	CO2,CO3
V	CO2,CO3
VI	CO2,CO3
VII	CO2,CO3
VIII	CO3, CO4

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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓

Course created by:
Signature:

Approved by:

Signature:



ERA UNIVERSITY
Department of Computer Science
Course Outline
Academic Year: 2026-27

Programme: Bachelor of Computer Application		Year: III		Semester: V	
Course Name: Information Security & Cyber Law		Course Code: B030503T			
Core/Elective/ Co-curricular/ Vocational: Core					
Credits: 04	Total No. of Lectures: 60 Lecture-Tutorial-Practical (in hours/week) L-T-P: 4-0-0				
Evaluation Spread	Internal Continuous	25	End Term Exam	75	
Course Objective	- To introduce the basic concepts of information security and cyber law. - To understand cyber threats, vulnerabilities, and security mechanisms. - To learn methods of protecting computer systems and networks. - To familiarize students with cybercrimes and legal frameworks in India.				
Course Outcome	After completing the course, students will be able to: CO1: Understand basic concepts of information security and cyber law. CO2: Identify cyber threats, attacks, and security vulnerabilities. CO3: Apply basic security mechanisms for protecting systems and data. CO4: Understand cryptography and authentication techniques. CO5: Explain cybercrimes and relevant legal provisions in India.				
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities				
Internal Evaluation Mode	Mid-term Examination: 10 Marks Quiz/Test: 05Marks Assignment: 05 Marks Presentation: 05 Marks				
UNITS	Topic			No. of Lectures	
I	Basics of Information Security: Need and Importance of Security, CIA Triad: Confidentiality, Integrity, Availability, Types of Information Assets, Threats, Vulnerabilities and Risks, Types of Attackers and Security Breaches, Introduction to Cyber Security.			8	
II	Types of Cyber Threats: Malware: Virus, Worm, Trojan Horse, Spyware, Ransomware, Phishing, Password Attacks and Identity Theft, Denial of Service (DoS), Prevention and Safety Measures.			8	
III	Basics of Network Security: Secure Communication Concepts, Firewalls and Proxy Servers, Intrusion Detection and Prevention Systems, VPN and Wireless Security Basics, Email and Web Security, Introduction to Cloud Security.			8	
IV	Introduction to Cryptography: Plain Text and Cipher Text, Encryption and Decryption Techniques, Symmetric and Asymmetric Key Cryptography, Digital Signatures and Digital Certificates.			8	
V	Operating System Security Basics: User Authentication Methods, Password Management Techniques, Biometric Authentication, Access Control Models, File and Database Security, Backup and Recovery Techniques.			8	

VI	Cyber Ethics & Responsible Computing: Types of Cyber Crimes, Hacking and Cracking, Cyber Stalking and Cyber Bullying, Online Fraud and Financial Crimes, Intellectual Property Rights (IPR).	7
VII	Introduction to Cyber Law: Need for Cyber Laws, Overview of Information Technology Act, 2000, Data Protection and Privacy Issues, E-Commerce and Legal Issues.	7
VIII	Mobile and Smartphone Security: Social Media Security, Internet of Things (IoT) Security Basics, Artificial Intelligence in Cyber Security, Ethical Hacking Basics, Cyber Security Awareness and Best Practices.	6
Suggested Readings: - Information Security Principles and Practice by Mark Stamp - Cyber Security and Cyber Laws by Nina Godbole - Cryptography and Network Security by William Stallings - Cyber Law Simplified by Vivek Sood		

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I	CO1
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VI	CO2,CO3
VII	CO2,CO3
VIII	CO3, CO4

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Mapped CO's with PO's and PSO's												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓

Course created by: Dr. Mohammad Islam
Signature:

Approved by:

Signature:

ERA UNIVERSITY
Department of Computer Science
Course Outline
Academic Year: 2026-27

Programme: Bachelor of Computer Application		Year: III		Semester: V	
Course Name: Introduction of Artificial Intelligence		Course Code: B030504T			
Core/Elective/ Co-curricular/ Vocational: Core					
Credits: 04	Total No. of Lectures: 60 Lecture-Tutorial-Practical (in hours/week) L-T-P: 4-0-0				
Evaluation Spread	Internal Continuous	25	End Term Exam	75	
Course Objective	1. Understand the basic concepts, history, and applications of Artificial Intelligence. 2. Learn intelligent agents, problem-solving methods, and search techniques used in AI systems. 3. Explore modern AI technologies such as Generative AI, Large Language Models, and Chatbots. 4. Analyze ethical issues, challenges, and future trends in Artificial Intelligence.				
Course Outcome	CO1: Explain the fundamental concepts, techniques, and applications of Artificial Intelligence. CO2: Apply problem-solving and search algorithms to simple AI problems. CO3: Demonstrate understanding of Generative AI, NLP, and Computer Vision concepts. CO4: Recognize ethical concerns, limitations, and future opportunities in Artificial Intelligence.				
Pedagogy	Demonstrations, Art Excursion, Interactive and activity based class sessions, skills-based activities				
Internal Evaluation Mode	Mid-term Examination: 10 Marks Quiz/Test: 05Marks Assignment: 05 Marks Presentation: 05 Marks				
UNITS	Topic			No. of Lectures	
I	Introduction to Artificial Intelligence: History and Evolution of AI Types of AI: Narrow AI, General AI, Generative AI. Applications of AI in Real Life, AI vs Human Intelligence, AI in Smartphones and Social Media. Introduction to Intelligent Systems, Future Scope and Career Opportunities in AI			8	
II	Introduction to Generative AI, Overview of Large Language Models (LLMs), Working of Chatbots and AI Assistants, Prompt Engineering Basics. AI Content Generation: Text, Image, Audio. AI Tools: ChatGPT, Gemini, Copilot, Perplexity. Ethical Use of Generative AI, AI Hallucination and Bias.			8	
III	Intelligent Agents and Environments, Types of Intelligent Agents, Problem Solving using AI, State Space Representation. Search Techniques: Breadth First Search, Depth First Search, Heuristic Search. Introduction to AI Games and Puzzle Solving, AI in Recommendation Systems			8	

IV	Definition and importance of knowledge , Knowledge representation, various approaches used in knowledge representation, Issues in knowledge representation. Logic: Propositional logic, First-order predicate logic, Propositional versus first-order inference, Unification and lifting, Forward chaining, Backward chaining, Resolution.	8
V	Expert System: Introduction, Representing using domain specific knowledge, Expert Systems: Architecture and role of expert systems, two case studies of Expert Systems.	8
VI	Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, learning by taking advice, learning in problem solving, learning from example-induction, Explanation based learning. Chatbots and Conversational AI, Speech Recognition Systems. Voice Assistants: Siri, Alexa, Google Assistant. AI in Language Translation	7
VII	Introduction to Computer Vision , Image Processing Basics, Face Detection and Recognition, Object Detection, Self-driving Cars (Concept), Robotics and Intelligent Machines, Industrial Automation using AI, Drones and Smart Surveillance System.	7
VIII	Indian AI Tools and Platforms: Krutrim AI, Sarvam AI, Hanooman AI, BharatGPT, Diksha Platform, Qure.ai, CropIn, Yellow.ai, saral.ai, Bharat AI kosh, , E sanjivini, Wysa chatbot.	6
Suggested Readings: 1. Artificial Intelligence: A Modern Approach – Stuart Russell and Peter Norvig 2. Artificial Intelligence – Elaine Rich and Kevin Knight 3. Introduction to Artificial Intelligence – Eugene Charniak 4. Expert Systems: Principles and Programming – Joseph C. Giarratano and Gary Riley		

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CO1	✓	✓	✓	✓					✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓



ERA University, Lucknow
Department of Computer Science
Course Outline
Effective from: 2025-26

Programme: Bachelor of Computer Application		Year: III		Semester: V
Course Name: Mini Project		Course Code: B030506P		
Credit	04	Total Sessions	60	
Evaluation Spread	Internal Continuous	100	End Term Exam	100

Course Objective:

After completing the Mini Project course, students will be able to:

1. Apply theoretical knowledge of computer science to solve real-world problems.
2. Develop analytical, logical, and programming skills through project implementation.
3. Gain practical exposure to software development tools, technologies, and methodologies.
4. Design, develop, test, and document a computer-based application or system.
5. Enhance teamwork, communication, and project management skills.
6. Understand the importance of problem identification, requirement analysis, and solution design.
7. Develop innovative and industry-oriented applications using modern technologies.
8. Improve presentation and report-writing skills through project documentation and demonstration.

Mini Project Guidelines

1. Objective of the Mini Project

- To apply theoretical knowledge in a practical environment.
- To gain experience in software development, testing, and documentation.
- To develop problem-solving, coding, teamwork, and communication skills.
- To prepare for major projects or real-world work after graduation.

2. Project Selection Guidelines

- **Relevance:** The project must be related to subjects you've studied.
- **Originality:** The project should be your own work. Avoid exact copies of online projects.
- **Scope:** Keep the project small and manageable for completion within semester.
- **Technology:** Use any modern tools/technologies that suit the project.
- **Approval:** Get project idea approved by your internal project guide or project coordinator.

3. Synopsis Submission

Once the project idea is approved, synopsis is to be submitted in the format provided within a week to the project coordinator dually signed by the internal project guide.

4. Project Report Structure

Your mini project documentation must include the following:

1. Title Page: The title page should contain

(i) Report title

(ii) Student name & enrolment number

(iii) Project guide name

(iv) University logo

(v) Department name

(vi) University name

2. Certificate of project guide & project coordinator

3. Acknowledgement

4. Table of contents

5. Chapters 1, 2, 3... and so on

6. Reference

7. Appendices

5. Submission of Report:

Student has to submit 2 copies of final project report to the Department office on or before final presentation.

6. Assessment of Final Field Work Report:

There are three components for the assessment on the field work report:

(i) Evaluation of Project work report

(ii) Evaluation of Oral Presentation

(iii) Viva

The Oral Presentation & Viva will be arranged by the department. The oral presentation should last within 20 minutes and 10 minutes for the viva (question and answer session) immediately after the presentation.

Course created by: Dr. Mohd Haleem

Signature:

Approved by:

Signature: