



Krishna Kanta Handiqui State Open University

Hiranya Chandra Bhuyan School of Science and Technology

Discipline of Computer Science

Programme name: Diploma in Computer Application and Artificial Intelligence (DCAAI)

Total Credits: 40

Minimum Qualification: Class 10+2 passed

Course Structure:

SEMESTER I:	COURSE 1: OFFICE PRODUCTIVITY TOOLS
	COURSE 2: DIGITAL FLUENCY AND EMERGING TECHNOLOGIES
	COURSE 3: APPLIED AI AND GENERATIVE AI
	COURSE 4: SOFT AND LIFE SKILLS
	COURSE 5: PRACTICAL
SEMESTER II:	COURSE 1: AI-ASSISTED WEB PROGRAMMING
	COURSE 2: AI-ASSISTED PYTHON PROGRAMMING
	COURSE 3: DIGITAL MARKETING
	COURSE 4: CYBER SECURITY
	COURSE 5: PRACTICAL

DETAILED COURSE-WISE SYLLABUS

SEMESTER I: COURSE 1: OFFICE PRODUCTIVITY TOOLS

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objective:

- Understand the basic concepts of computer systems, operating systems, and hardware components essential for digital literacy.
- Develop practical skills in using office productivity tools such as word processors, spreadsheets, presentation software, and database management systems in both

proprietary and open-source environments.

- Acquire the ability to create, format, manage, and analyse digital documents, data, and presentations for academic and professional purposes.
- Gain proficiency in regional language computing using Unicode standards and appropriate input tools for Assamese/Bengali/Bodo typing and formatting.

Course Outcome:

On completion of this course, the learners will be able to:

- Explain the components and functions of computer systems and operating systems.
- Create and format professional documents, spreadsheets, presentations, and databases using MS Office and LibreOffice tools.
- Apply spreadsheet formulas, data management techniques, charting tools, and database queries to organize and analyse data effectively.
- Demonstrate the ability to type, format, and manage documents in regional languages using Unicode fonts and appropriate keyboard/input tools.

Unit 1: Introduction to Computer System

Definition: Computer, Booting a computer, Hardware Components: Input, Output, Processing Unit and Computer Memory: Primary and Secondary (Hard Disk, Pen drive etc.)

Unit 2: Introduction to operating System

Definition: OS; Types of OS; Functions of OS; Open-source vs Proprietary OS: Major OS: Windows (11); Linux; Mac OS;

Unit 3: Introduction to LibreOffice

Overview of LibreOffice software suite and its features, Advantages of using LibreOffice as an alternative to proprietary software, Installation and configuration of LibreOffice on different platforms

Unit 4: Introduction to Word Processing Software

Starting MS-Word in Windows 11; MS-Word User Interface; Creating and Editing a Document; Formatting Text; Paragraph Formatting; Working with Pages; Inserting Elements; Page Layout & Design; Saving, Sharing, and Exporting

Unit 5: Introduction to Spreadsheet Software

Starting Excel in Windows 11; Excel User Interface; Basic Excel Operations; Formatting Worksheets; Basic Formulas and Functions; Charts and Data Visualization; Basic Data Management: Sorting, Filtering;

Unit 6: Introduction to Presentation Software

Starting MS-PowerPoint in Windows 11; PowerPoint User Interface; Creating a New Presentation; Working with Slides; Adding and Formatting Text; Working with Objects; Transitions and Animations; Multimedia in Presentations; Working with Views; Preparing & Delivering a Presentation; Saving, Exporting & Printing

Unit 7: Introduction to Database Software

Overview of MS-Access; Starting MS-Access in Windows 11; MS-Access Interface; Database Objects in MS-Access; Creating and Managing Tables; Working with Data; Queries; Forms; Reports; Saving, Opening, and Closing Databases

Unit 8: Introduction to Word Processing in Regional Language Assamese/Bengali/Bodo

Word Processing Basics: Unicode, Importance of Unicode for Assamese/Bodo/Bengali, Unicode fonts for regional languages (examples), Difference between Unicode and non-Unicode fonts; Introduction to regional language keyboard layouts; InScript keyboard; Phonetic keyboards, Use of virtual keyboards, Typing tools and

software, Google Input Tools, Indic IME / Keyman, Switching between English and regional language typing; Naming files in regional languages etc. **Text Formatting in Regional Languages:** Font selection (regional language fonts), Font size, style (bold, italic, underline), Text alignment (left, center, right, justify), Line spacing and paragraph spacing, Use of bullets and numbering in regional languages

Unit 9: Getting started with Writer

Launching Writer and creating a new document, Navigating the Writer interface and understanding the different components of the document window, Entering and formatting text, applying font styles, and working with paragraphs, Saving, closing, and opening existing documents in different formats.

Unit 10: Working with templates and styles in Writer

Creating and using document templates for consistent formatting and layout, Creating and modifying paragraph and character styles for consistent text formatting, Managing styles in the Styles and Formatting dialog box.

Unit 11: Formatting documents in Writer

Adding and formatting images, tables, and other objects in a document, Applying advanced formatting options, such as page borders, columns, and page backgrounds, Using Writer's built-in tools for spell-checking, grammar-checking, and language translation.

Unit 12: Introduction to Calc

Overview of Calc and its features as a spreadsheet program, Launching Calc and creating a new spreadsheet, Navigating the Calc interface and understanding the different components of the worksheet window, Entering and formatting data, applying cell formatting, and working with formulas.

Unit 13: Working with functions and formulas in Calc

Using built-in functions and formulas for common calculations in Calc, Creating custom functions and formulas for complex calculations, Using conditional formatting to highlight data based on certain criteria.

Unit 14: Advanced formatting and charting in Calc

Applying advanced formatting options, such as conditional formatting, data validation, and custom number formats, Creating and modifying charts to visualize data in different ways, Using Calc's built-in tools for filtering, sorting, and analyzing data

Unit 15: Introduction to Impress

Overview of Impress and its features as a presentation program, Launching Impress and creating a new presentation, Navigating the Impress interface and understanding the different components of the slide window, Adding and formatting slides, applying transitions, and customizing presentation settings, Adding images, audio, and video to a presentation, Creating and modifying animations to enhance visual effects, Using Impress's built-in tools for recording and rehearsing presentations

Unit 16: Introduction to Base

Overview of Base and its features as a database management tool, Launching Base and creating a new database, Navigating the Base interface and understanding the different components of the database window, creating tables, forms, queries, and reports using Base's built-in tools

COURSE 2: DIGITAL FLUENCY AND EMERGING TECHNOLOGIES

Course Type:	Core
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Number of Credits:	4
Total Marks:	100

Course Objectives:

- Understand the fundamental concepts of e-learning, digital platforms, and online collaboration tools used in modern education and business environments.
- Develop practical skills in using digital tools and services such as Google applications, video conferencing platforms, social media, and e-commerce systems.
- Gain foundational knowledge of emerging technologies including Artificial Intelligence, Data Science, IoT, Cloud Computing, Big Data, and Blockchain.
- Understand digital governance systems and the role of technology in transforming public services, industry, and society (Industry 4.0 and Education 4.0).

Course Outcome:

On completion of this course, the learners will be able to:

- Effectively use e-learning platforms, search engines, Google services, and video conferencing tools for academic and professional purposes.
- Apply digital communication and collaboration tools, including social networking platforms and e-commerce applications, in real-world scenarios.
- Explain the basic concepts, applications, and societal impact of emerging technologies such as AI, Machine Learning, IoT, Cloud Computing, Big Data, and Blockchain.
- Demonstrate awareness of digital governance models and online public service systems, and evaluate their role in promoting digital transformation and inclusive development.

Unit 1: Introduction to eLearning

Definition, Asynchronous/Synchronous Learning, e-learning Platforms: Proprietary and open source, Learning Management System (LMS), MOOCs: definition, various MOOC platforms like SWAYAM, Coursera, Edx, Audacity, FutureLearn etc.

Unit 2: Searching Techniques

Search Engines, Searching Techniques; Google, Bing, Advanced Search Options in Google, Translator: Google, Bing

Unit 3: Working with Google Services I

Working with Gmail, Google Docs: creating and posting; Google Sheets: creating and editing; Google Drive: uploading and sharing of files and folders

Unit 4: Working with Google Services II

Google Forms: Creating and analysis of response; Google Voice Assistant; Google Classroom: Creating classroom, Taking class etc.

Unit 5: E-commerce

Introduction, Types of E-commerce, Applications of E-commerce with examples

Unit 6: Video Conferencing Tools

Introduction, Working with various video conferencing tools like Google Meet, Zoom, WebX, Microsoft Teams, etc

Unit 7: Working with Social Networks

Introduction, Working with various Social Networking Sites like WhatsApp, Youtube, Telegram, Facebook, X, Instagram etc.

Unit 8: Introduction to Artificial Intelligence and Machine Learning

Definition of Artificial Intelligence (AI); Brief history of AI; Types/Categories of AI;

Applications of AI: Healthcare, Agriculture, Education etc.; Machine Learning: definition, Supervised learning, Unsupervised learning; Introduction to Industry 4.0 and applications, Introduction to Education 4.0. and applications;

Unit 9: Introduction to Data Science

Definition, of Data Science; Components of Data Science; Data Scientist: Role and Responsibilities; Tools and Technologies used; Applications of Data Science: Healthcare, Education etc.

Unit 10: Introduction to Internet of Things (IoT)

Definition, basic concepts of IoT and its applications like Smart Home, Smart vehicles, IoT in Agriculture

Unit 11: Introduction to Cloud Computing

Cloud Computing: Definition; Types of Cloud: Public cloud; Private cloud; Hybrid cloud; Community cloud; Types of Cloud services: Infrastructure as a Service (IaaS), Platform as a Service (IaaS) and Software as a Service (SaaS), Applications of Cloud Computing

Unit 12: Introduction to Big Data

Big Data: Definition, Characteristics, Types of Big Data: Structured, Un-structured, Semi-structured; Apache Hadoop; Big Data Platforms, Applications of Big Data

Unit 13: Introduction to Blockchain Technology

Introduction to Blockchain Technology and its Importance, Evolution of the Blockchain Technology, Elements of a Blockchain, Blockchain Applications

Unit 14: E-Governance and Applications

E-Governance Models: (G2B,G2C,C2G,G2G), Challenges to E-Governance, Strategies and tactics for implementation of E-Governance, Applications of E-Governance; Digilicker; ADDAR; PAN card; UPPAR ID; mParivathan; DigiYatra;

COURSE 3: APPLIED AI AND GENERATIVE AI

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objective:

- Understand the basic concepts and applications of Artificial Intelligence (AI).
- Explore the various subfields of AI including computer vision, NLP, and robotics.
- Introduce the learners to Machine Learning and Deep Learning concepts.
- Apply AI concepts in real-life applications such as education, office, and social media.

Course Outcome:

On completion of this course, the learners will be able to:

- Define AI and its subfields including its impact and evolution.
- Identify the application of AI in areas like computer vision and NLP.
- Explain machine learning and deep learning concepts.
- Apply Generative AI techniques in education, office, and social environments.

Unit 1: Introduction to Artificial Intelligence

Definition of Artificial Intelligence; Introduce the fundamental concepts of Artificial Intelligence (AI) and its real-world applications; History and evolution of AI; Importance and impact of AI in modern society

Unit 2: AI Applications

AI applications in education, healthcare, agriculture etc.; AI in smart devices and services; Ethical concerns and future possibilities

Unit 3: Computer Vision, NLP and Speech Processing

Introduction to Computer Vision and applications; Introduction to Natural Language Processing (NLP) and applications; Introduction to Speech Processing and Applications

Unit 4: Robotics & Expert Systems

Fundamentals of Robotics and applications; AI-Powered Autonomous Systems; Expert Systems: Definition, Components, and applications

Unit 5: Machine Learning & Deep Learning

Introduction to Machine Learning; Types of Machine Learning: Supervised, Unsupervised, Reinforcement Learning and applications; Introduction to Neural Networks, Deep Learning and applications

Unit 6: Introduction to Generative AI

Definition and Basics of Generative AI; Basics of LLM, how LLM works;

Unit 7: Commonly Used Generative AI Platforms

Introduction to Commonly Used Generative AI Platforms: ChatGPT, Gemini, Copilot, Perplexity, DeepSeek, Grok etc.

Unit 8: Prompt Engineering

Basics of Prompt Engineering; Effective Prompting Techniques for AI Models; Use Cases of Prompt Engineering in AI Applications

Unit 9: Generative AI in Education

AI-Powered Learning Assistants; AI for Content Generation; AI for Personalized Learning Experiences; Ethical Considerations

Unit 10: Generative AI in the Office Environment

Generative AI in the Office Environment; AI-Enhanced Correspondence; AI in Documentation and Reporting; AI for Meeting Management; AI in Proposal Development; AI for Document Summarization and Report Generation; AI-Powered Virtual Assistants in Workplaces;

Unit 11: Generative AI in Social Media

AI for Facebook, YouTube, Instagram, X etc.

Unit 12: Generative AI in Healthcare and Agriculture

AI Application in Healthcare and Agriculture

Unit 13: Exploring Various AI Tools I

Hands-on Experience with various AI Tools in various domains; Practical Use Cases and Demonstrations

Unit 14: Exploring Various AI Tools II

Exploring Various AI Tools developed in India

COURSE 4: SOFT AND LIFE SKILLS

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objective:

- Develop effective communication skills including listening, speaking, reading, writing, and non-verbal communication for academic, professional, and social contexts.
- Enhance interpersonal, leadership, and collaborative skills necessary for group discussions, interviews, teamwork, and workplace interactions.
- Build cognitive, managerial, entrepreneurial, and financial management skills for career readiness and responsible decision-making.
- Acquire essential life skills including digital literacy, ethical conduct, self-management, adaptability, and basic life-saving competencies for personal and professional well-being.

Course Outcome:

On completion of this course, the learners will be able to:

- Communicate effectively using verbal and non-verbal techniques, demonstrate active listening, and produce structured written content in different modes.
- Participate confidently in group discussions, interviews, presentations, and collaborative activities while exhibiting leadership and teamwork qualities.
- Apply managerial, entrepreneurial, financial, and digital literacy skills responsibly in personal and professional environments.
- Demonstrate life skills such as self-management, ethical decision-making, adaptability, emergency response awareness, and culturally appropriate behavior in diverse situations.

Unit 1: Listening and Speaking

Effective Listening and Speaking, Listening and Comprehension, Probing Questions and Their Importance in Listening and Speaking, Barriers to Effective Listening, Pronunciation and Its Importance, Enunciation and Its Importance, Vocabulary and Its Role in Effective Listening and Speaking, Fluency and Its Importance in Speaking and Common Errors in Listening and Speaking

Unit 2: Reading, Writing and Different Modes of Writing

Steps in the Process of Reading, Meaning of Writing, Techniques of Effective Writing, Different Modes of Writing and Common Uses of Writing

Unit 3: Digital Literacy and Social Media, Digital Ethics and Cyber Security

Microsoft Office Suite Proficiency, Virtual Communication Platforms, Cybersecurity Awareness, Digital Ethics and Etiquette

Unit 4: Nonverbal Communication

Meaning of Verbal and Nonverbal Communication, Functions of Nonverbal Communication, Purposes of Using Nonverbal Communication, Types of Nonverbal Communication, Examples of Different Nonverbal Communications, Advantages and Disadvantages of Nonverbal Communication, Importance of Nonverbal Communication

Unit 5: Group Discussion Skills And Interview Skills

Meaning of Group Discussion and Interview, Objectives of Group Discussion, Types of Group Discussion, Importance of Group Discussion, Way to Conduct a Group Discussion, Process of Group Discussion, Essential Skills for Group Discussion, Interview, Interview Skill

Unit 6: Exploring Career Opportunities And Résumé Skills

Knowing Yourself while Looking for a Job, Need for the Right Job or Employment, Career Information: Sources and Availability of Career Opportunities, What is a

Résumé? Components of a Good Résumé, Difference between a Résumé, CV and Biodata

Unit 7: Cognitive And Non-cognitive Skills, Presentation Skills And Listening Skills

Meaning of Skills, Meaning of Cognitive and Non-Cognitive Skills, Meaning of Presentation Skills, Meaning of Listening Skills

Unit 8: Trust And Collaboration, Brainstorming, Social And Cultural Etiquettes And Internal Communication

Meaning of Teamwork and Collaboration, Trust and Collaboration, Brainstorming, Social and Cultural Etiquettes

Unit 9: Leadership skills, Innovative Leadership And Design Thinking

Leadership: Meaning and Importance, Characteristics and Theories of Leadership, Leadership styles, Basic Leadership Skills, Innovative Leadership, Concept of Emotional and Social intelligence, Leaders in the Era of Globalisation, Design Thinking

Unit 10: Managerial Skills

Basic Managerial Skills, Managing Conflict, Types of Conflict and their Management, Resolving Conflict Through Negotiation, Self-Management Skills, Understanding Self-Concept, Self-management, Managing Personal Finance

Unit 11: Entrepreneurship Skills, Ethics And Integrity

Basics of Entrepreneurship, Classification and Types of Entrepreneurships, Traits and Competencies of Entrepreneur, creating Business Plan, Ethics and Conduct, Importance of Ethics, Personal and Professional Moral Codes of Conduct

Unit 12: Financial Management Skills

Basic financial management skills: Budgeting, income and expense tracking, saving habits, banking fundamentals, digital payment systems, and basic investment awareness.

Unit 13: Basic Acclimatizing Skills

Essential life skills: adapting to independent living, basic cooking skills: kitchen safety, hygiene practices, basic food preparation techniques, simple meal planning, nutrition awareness, and safe handling of cooking equipment.

Unit 14: Basic Life Saving Skills

Fundamental life-saving skills especially emergency response techniques: basic first aid principles, CPR (Cardiopulmonary Resuscitation), handling minor injuries, emergency preparedness, safety awareness, and responsible response during accidents or health emergencies.

COURSE 5: PRACTICAL

Additional content or changes may be incorporated into the practical component as deemed necessary.

Practical Components of: OFFICE PRODUCTIVITY TOOLS

1. For MS-Word: Create formatted letters, resume, notice/circular and insert: Table, Images, page numbers and also use page layout options, margins and orientation and save document in: .docx and PDF formats
2. For MS-Excel: Create student mark sheet/salary sheet/budget sheet and use formula's like SUM, AVERAGE, IF; Also apply: Sorting, Filtering and Create charts: Bar chart, Pie chart and use conditional formatting.

3. For MS-PowerPoint: Create slide presentation on any topic and apply Themes, Transitions, Animations and insert images, audio, video and use rehearse timing.
4. For MS-Excess: Create a database for Student record system OR Library management. Create: Tables with primary key, Data entry, Queries (simple select query), Forms, Reports
5. Word Processing in Regional Languages: Install Indic typing tools and type paragraph in Assamese/Bengali/Bodo and save file with Unicode naming.
6. Download and install LibreOffice.
7. LibreOffice Writer: Create formatted document like official letter. Use options like Styles, Templates and Insert: Table, Images, Page borders and Apply: Columns, Spell-check.
8. LibreOffice Calc: Create data sheet and apply: Formulas, Functions and use: conditional formatting, data validation, create charts and analyze data using filters.
9. LibreOffice Impress: Create professional presentation; Apply slide master, Add animations, transitions, Insert multimedia.
10. LibreOffice Base: Create database, Create tables, Define primary key, Create form, Run query, Generate report.

Practical Components of: DIGITAL FLUENCY AND EMERGING TECHNOLOGIES

11. Perform advanced Google searches
12. Create: Google Doc, Google Sheet, Google Form
13. Create and manage a Google Classroom
14. Host a meeting on Google Meet/Zoom.
15. Create professional social media profile.
16. Explore DigiLocker, mParivahan, DigiYatra portal.

Practical Components of: APPLIED AI AND GENERATIVE AI

17. Use: ChatGPT, Gemini, Copilot, Perplexity
18. Write basic prompts and then improve using: Role prompting, Few-shot prompting, Chain-of-thought prompting
19. Using Gen. AI: Lesson plan, Quiz questions, Learning objectives
20. Draft official mails using Gen. AI and generate meeting minutes
21. Generate: Instagram captions, YouTube script
22. Hands-on exploration of AI tools like: Canva AI, Notion AI, Grammarly, DeepSeek, Indian AI platforms (Bhashini, Krutrim, etc.)

Practical Components of: SOFT AND LIFE SKILLS

23. Preparation of monthly budget and income-expense tracking sheet.
24. Demonstration of kitchen safety.
25. Nutrition awareness poster creation.
26. First aid demonstration.
27. CPR demonstration (using dummy/mannequin if available).
28. Emergency response drill.
29. Disaster preparedness role-play.

SEMESTER II:

COURSE 01: AI-ASSISTED WEB PROGRAMMING

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objectives:

- Understand the fundamentals of AI-assisted development, including prompt engineering, AI coding assistants, and the role of machine learning concepts in modern web programming.
- Develop front-end web applications using HTML, CSS, JavaScript, and front-end frameworks with the support of AI-powered development environments.
- Build and integrate back-end systems, databases, and APIs using AI-assisted tools to create full-stack web applications.
- Apply AI-based testing, debugging, deployment strategies, and ethical security practices to develop secure, optimized, and production-ready web applications.

Course Outcome:

On completion of this course, the learners will be able to:

- Utilize AI-assisted IDEs and prompt-writing techniques to generate, modify, and optimize web development code efficiently and responsibly.
- Design and implement responsive and interactive front-end web interfaces using modern web technologies with AI support.
- Develop full-stack web applications by integrating server-side programming, databases, and REST APIs using AI-assisted tools.
- Evaluate, test, debug, secure, and deploy web applications while demonstrating ethical use of AI and adherence to cybersecurity best practices.

Unit 1: Introduction to AI-Assisted Web Programming

Introduction to Artificial Intelligence in web development, overview of AI coding assistants, basic concepts of machine learning in programming, advantages and limitations of AI tools, introduction to prompt writing for generating code, and applications of AI in modern web development.

Unit 2: AI-Powered Development Environment and IDEs

Introduction to development environments, installation and setup of AI-enabled IDEs (such as VS Code with AI plugins), code auto-completion, documentation generation using AI, basic Git and version control support, and improving coding productivity using AI tools.

Unit 3: AI-Assisted HTML Fundamentals

Basics of HTML structure, tags, attributes, forms, tables, semantic HTML elements, accessibility basics, webpage layout generation using AI tools, and basic SEO-friendly HTML coding.

Unit 4: AI-Assisted CSS and Styling

Introduction to CSS, selectors, colors, fonts, box model, layout techniques (Flexbox, Grid basics), simple animations, responsive styling basics, and using AI tools to generate CSS styles and UI designs.

Unit 5: Responsive Web Design

Concept of responsive design, media queries, mobile-first approach, viewport settings, responsive images, basic UI adaptation techniques, and AI assistance for responsive layout

suggestions.

Unit 6: JavaScript Fundamentals with AI

Introduction to JavaScript, variables, data types, operators, functions, events, conditional statements, loops, simple debugging with AI assistance, and basic client-side scripting.

Unit 7: DOM Manipulation Using AI

Understanding DOM structure, selecting elements, event handling, form validation basics, dynamic content updates, and AI-assisted debugging and script improvement.

Unit 8: AI-Assisted Front-End Frameworks

Basic introduction to front-end frameworks (React/Vue/Angular overview), component concept, simple UI development, project scaffolding with AI tools, and basic front-end application structure.

Unit 9: AI-Assisted Back-End Frameworks

Introduction to server-side programming, Node.js or Python backend basics, handling requests and responses, basic REST API concept, simple backend coding with AI support.

Unit 10: Database Integration with AI Assistance

Introduction to databases, SQL basics, CRUD operations, database connectivity in web apps, introduction to NoSQL, simple schema design, and AI-assisted query generation.

Unit 11: AI-Assisted Testing and Debugging

Basics of software testing, debugging techniques, common coding errors, AI-based error detection, performance optimization basics, and testing simple web applications.

Unit 12: Web Security and Ethics in AI Programming

Introduction to web security, common vulnerabilities (XSS, SQL injection basics), password security, data privacy concepts, ethical AI use, plagiarism concerns, and responsible coding practices.

Unit 13: AI-Assisted Deployment

Basics of web hosting, domain and server concepts, cloud deployment introduction, version control deployment, simple CI/CD overview, and AI assistance in deployment processes.

Unit 14: Advanced AI-Assisted Web Programming

Introduction to chatbot integration, AI APIs, automated UI generation, intelligent web applications, future trends in AI web development, and basic mini-project development.

COURSE 02: AI-ASSISTED PYTHON PROGRAMMING

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objective:

- Develop a strong foundation in Python programming concepts including data types, control structures, functions, object-oriented programming, and file handling.
- Gain hands-on experience in configuring and using Python development environments, including AI-assisted IDEs and cloud-based platforms.
- Learn to integrate AI tools effectively to enhance coding productivity, debugging, optimization, and problem-solving.
- Apply Python libraries such as NumPy, Pandas, and Matplotlib for data handling, analysis, and visualization in real-world applications.

Course Outcome:

On completion of this course, the learners will be able to:

- Install, configure, and work efficiently in Python environments such as Jupyter Notebook, Google Colab, and AI-assisted IDEs.
- Write structured Python programs using appropriate data structures, control statements, functions, modules, and object-oriented programming principles.
- Utilize AI-assisted development tools responsibly to generate, debug, and optimize Python code while critically evaluating AI outputs.
- Analyze, manipulate, and visualize data using Python libraries such as NumPy, Pandas, and Matplotlib to solve basic real-world computational problems.

UNIT 1: Installation of Python

Python Installation, Working with Google Colab, Anaconda Installation, Working with Jupyter Notebook, Spyder

UNIT 2: Introduction to Python with AI-Assisted IDEs

Various AI-Assisted IDEs for Python, Basic Python Programming vs AI-Assisted Programming, Examples

UNIT 3: Python Basics

Atoms, Identifiers and keywords, Literals, Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment operator, Bit wise operator, Identity and Membership operator.

UNIT 4: Strings

Strings, String properties, Built-in functions, String Methods, String Conversions, String Comparisons

UNIT 5: Decision Control Statements

Input and Output Statements, Control statements, Conditional Statements- if...else, Nested if statements, Ternary Operators.

UNIT 6: Loop Control Statements

Looping- while Loop, for Loop, Loop Control, break, continue and pass.

UNIT 7: Lists

Lists, Accessing List elements, looping in Lists, Basic List operations, Using built-in functions on Lists, List methods, Sorting and reversing.

UNIT 8: Tuples

Tuples, accessing tuple elements, looping in tuples, basic tuple operations, using built-in functions on Tuples, Tuple methods, Tuple varieties

UNIT 9: Sets

Definition of set, accessing set elements, looping in sets, basic set operations, Sets, Sets Methods and Functions

UNIT 10: Dictionaries

Dictionary, definition of dictionaries, accessing dictionary elements, looping in dictionaries, basic dictionary operations.

UNIT 11: Functions

Functions: Definition, call, positional and keyword parameter. Default parameters, variable number of arguments

UNIT 12: Modules

Modules: import mechanisms, Functional programming: map, filter, reduce, max, min. lambda function.

UNIT 13: Object Oriented Programming

Object Oriented Programming, Definition of Classes and Objects, Python Inheritance, Different types of Inheritance with examples.

UNIT 14: File Processing

File Processing: reading and writing files, manipulating file pointers using seek.

Unit 15: Python Libraries

Working with various libraries - NumPy, Pandas, Matplotlib, etc.

COURSE 03: DIGITAL MARKETING

Course Type:	Core
Number of Credits:	4
Total Marks:	100 (Formative: 30, Summative: 70)

Course Objectives:

- Understand the fundamental concepts, tools, and strategies of digital marketing, including SEO, social media marketing, analytics, and online advertising.
- Develop practical skills in keyword research, website planning, search engine optimization, and local business listing to improve online visibility.
- Gain hands-on knowledge of managing digital platforms such as social media channels, Google Analytics, e-commerce systems, and paid advertising tools.
- Build the ability to design, implement, and evaluate digital marketing campaigns using automation tools and performance metrics.

Course Outcome:

On completion of this course, the learners will be able to:

- Explain digital marketing concepts, tools, and techniques and differentiate them from traditional marketing approaches.
- Conduct keyword research, optimize websites for search engines, and enhance online presence using SEO and local business tools.
- Create and manage digital marketing campaigns across platforms such as social media, e-commerce websites, and Google advertising networks.
- Analyse marketing performance using analytics tools, automate marketing activities, and apply monetization strategies effectively and ethically.

Unit 1: Basics of Digital Marketing

Definition; Importance of Digital Marketing; working of digital marketing; advantages of digital marketing over traditional marketing; types of digital marketing

Unit 2: Keyword Research

Understanding keyword and its types; keyword research: tools for keyword research, localized keyword research; analysis of competitor website keyword; finalizing keyword for a project.

Unit 3: Website Planning

Importance of Domain name and domain extension; types of website: based on functionality and purpose; Planning of website design: content, plugin, engagement options; landing page and optimization.

Unit 4: Search Engine Optimization

Introduction to search engine and how it works; Concept of search engine optimization; Understanding the Search Engine Results Page; indexing; crawling

Unit 5: Social Media Marketing

Understanding social media and its marketing tools: paid marketing, organic marketing; Social Media optimization, Understanding marketing through Facebook, Instagram, YouTube, Google

Unit 6: Google mapping and Local Business

Listing of local in search engine; Image, video and Map setup in google places; visibility report of search engine and google reviews.

Unit 7: Google Analytics

Introduction and working of Google Analytics; Google analytics- account structure, insights, cookie training; setting up analytics account; how to add google analytics in website

Unit 8: WhatsApp Marketing

Understanding WhatsApp Marketing; WhatsApp push notification; WhatsApp Business; tools and settings in WhatsApp business; Limitations of WhatsApp

Unit 9: Facebook marketing

Introduction to Facebook-insights, algorithm; Understanding Facebook ads- organic and paid, targeting option; Facebook page management

Unit 10: X Marketing

Introduction to X Marketing; X marketing insights- dos and don'ts; Ad Content and targeting; fundamental of Influencer marketing; use of hashtags, tools

Unit 11: Instagram Marketing

Introduction to Instagram platform. Creation of Business page in Instagram; Marketing tools and Ads; Drive engagement and Lead generation; account switching

Unit 12: YouTube Marketing

Channel creation in YouTube; Uploading video and optimization; Video creation and story lineup; monetization of YouTube Channel; Case study

Unit 13: E-commerce marketing

E-commerce website and its advantages; marketing concept; Motivating shopping for online; affiliation marketing

Unit 14: Social Media Automation

Social Media automation- tools and process; Automatized report, analytics, best time to share; Rules related to automation

Unit 15: Google Ad Sense and AdWords

AdSense and process of earning through it; process of approval of AdSense; Placing Ads in website; AdWords and Ad placement; approval for AdWords; how to get Ads in Blog/YouTube.

COURSE 04: CYBER SECURITY

Course Type:	Core
Number of Credits:	4
Total Marks:	100

Course Objectives:

- Understand the fundamentals of cyberspace, internet architecture, and the core concepts and challenges of cyber security.
- Gain knowledge of various types of cyber crimes, cyber threats, social engineering attacks, and digital payment frauds along with their preventive measures.
- Develop awareness of cyber laws, IT Act 2000 provisions, regulatory frameworks, and legal remedies related to cyber security in India.
- Acquire practical knowledge of digital device security, Wi-Fi protection, social media safety, and best practices for secure online transactions and communication.

Course Outcome:

On completion of this course, the learners will be able to:

- Explain the structure of cyberspace, internet infrastructure, and the emerging trends and challenges in cyber security.
- Identify different types of cyber crimes, social engineering techniques, malware attacks, and digital payment frauds, and suggest appropriate preventive measures.
- Interpret relevant cyber laws, including the IT Act 2000 and RBI guidelines, and demonstrate awareness of reporting mechanisms and legal protections.
- Apply cyber security best practices to secure digital devices, Wi-Fi networks, social media platforms, and e-commerce transactions in real-life scenarios.

Unit 1: Introduction to Cyberspace

Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology.

Unit 2: Introduction to Internet and Cyber Security

Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.

Unit 3: Cyber Crime 1

Classification of cyber-crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children.

Unit 4: Cyber Crime 2

Financial frauds, Social engineering attacks, malware and ransomware attacks, zero day and zero click attacks.

Unit 5: Cyber Law

Cybercriminals modus-operandi , Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organisations dealing with Cyber crime and Cyber security in India, Case studies.

Unit 6: Introduction to Social Media

Introduction to Social networks, Types of Social media, Social media platforms.; Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social networks.

Unit 7: Handling Social Media

Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social networks.

Unit 8: Security Issues in Social Media

Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.

Unit 9: Introduction to E-Commerce

Definition of E- Commerce, Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E Commerce security best practices.

Unit 10: Introduction to Digital Payments

Introduction to digital payments, Components of digital payment and stake holders, Modes of digital payments- Banking Cards, Unified Payment Interface (UPI), e-Wallets, Unstructured Supplementary Service Data (USSD), Aadhaar enabled payments.

Unit 11: Security Aspects in Digital Payments

Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorised banking transactions. Relevant provisions of Payment Settlement Act,2007.

Unit 12: Digital Devices Security I

End Point device and Mobile phone security, Password policy, Security patch management, Data backup, Downloading and management of third party software.

Unit 13: Digital Devices Security II

Device security policy, Cyber Security best practices, Significance of host firewall and Anti-virus, Management of host firewall and Antivirus.

Unit 14: Wi-Fi Security

Introduction to Wi-Fi, Types of Wireless security: Wired Equivalent Privacy (WEP), Wi-Fi Protected Access (WPA), Wi-Fi Protected Access 2 (WPA 2), Wi-Fi Protected Access 3 (WPA 3); Threats and risks to Wi-Fi Security, Ways to protect Wi-Fi network, Types of WiFi network security devices, Configuration of basic security policy and permissions

Unit 15: Latest Trends

Latest Cyber Security Trends, Reports Analysis, Attack Trends; Forbes Magazine etc.

COURSE 5: PRACTICAL

Additional content or changes may be incorporated into the practical component as deemed necessary.

Practical Components of: AI-ASSISTED WEB PROGRAMMING

1. Compare AI-generated code vs manually written code (simple HTML page).
2. Install and configure VS Code with AI plugin (Copilot/Codeium).
3. Initialize Git repository and push code to GitHub.
4. Use AI to generate: A semantic HTML webpage, A student registration form, A table with sample data
5. Generate CSS using AI for: Card layout, Navigation bar, Responsive form
6. Generate JavaScript code using prompts: Form validation, Simple calculator, Loop-based number series
7. Create dynamic webpage: Add/remove elements dynamically; Use AI to improve event handling logic.
8. Use AI to scaffold a simple React app and create 2–3 components (Navbar, Card, Footer).
9. Create simple Node.js or Python server and build REST API with: GET and POST
10. Generate SQL queries using AI.
11. Use AI to identify and fix: Syntax errors and Logic errors; To detect performance improvements.
12. Use AI to generate deployment steps.

Practical Components of: AI-ASSISTED PYTHON PROGRAMMING

13. Install Python using Anaconda.
14. Create and run a simple program in: Jupyter Notebook, Google Colab, Spyder
15. Install an AI-assisted IDE (VS Code + Copilot/Codeium). Write a simple calculator: First manually and then using AI suggestions.
16. Use AI to generate a program using all operator types in one script.

17. Write a programs to: count vowels and consonants in a string, reverse a string, check if a string is palindrome, compare two strings, and convert string to uppercase/lowercase using methods.
18. Write programs to: Find largest of three numbers, Grade calculator using if-else, Menu-driven program using nested if.
19. Write programs to: Print multiplication table, Generate Fibonacci series, Check prime number, Factorial using while loop, Use break and continue in examples. And use AI to debug an infinite loop program.
20. Write programs to: Accept list from user and find: Maximum, Minimum, Sum
21. Write programs to: Create tuple and access elements and Convert list to tuple.
22. Write programs to: Perform union, intersection, and remove duplicates from list using set.
23. Write programs to: Create student dictionary (name, marks), Find student with highest marks, Count word frequency in sentence, Merge two dictionaries.
24. Write programs to: Create function for checking prime number and to calculate factorial of a number; Function with default arguments; Function with variable arguments; Recursive function example.
25. Write programs to: Create custom module and import it; Use math module. Use lambda with map, filter, reduce. And Find maximum and minimum using built-in functions.
26. Write programs to: Create class Student with attributes and methods; Demonstrate: Single inheritance, Multiple inheritance, Multilevel inheritance.
27. Write programs to: Write data to file; Read file content; Count words in file; Use seek() to move file pointer.
28. Write programs using: NumPy (To create arrays, Matrix addition and multiplication); Pandas (To create DataFrame, Read CSV file, Basic data analysis like mean, median etc.) Matplotlib (Plot: Line graph, Bar graph, Pie chart)
29. Compare own code with code generated through AI.

Practical Components of: DIGITAL MARKETING

30. Use tools like: Google Keyword Planner or Ubersuggest to identify: Short-tail keywords, Long-tail keywords, Local keywords and perform competitor keyword analysis.
31. Select domain name (theoretical planning) for website planning.
32. Perform On-page SEO: Meta title, Meta description, Image alt text.
33. Create business pages on: Facebook, Instagram.
34. Design 5 promotional posts using Canva. Write engaging captions with hashtags.
35. Create Google Analytics account. Add tracking code to demo website. Analyze: Users, Sessions, Traffic source.
36. Create WhatsApp Business profile. Set: Business hours, Catalog, Auto-replies
37. Create Facebook business page. Design mock ad campaign: Objective, Audience targeting, Budget planning.
38. Create X business profile. Write 5 promotional tweets. Use relevant hashtags.
39. Create Instagram business account. Design: 3 posts, 2 reels concept. Write captions and hashtag strategy.
40. Create YouTube channel. Upload 1 promotional video. Optimize: Title, Description, Tags. Create thumbnail. And Study monetization requirements.
41. Create Google Ads mock campaign: Keyword selection, Budget, Targeting. And analyze ad copy effectiveness.

Practical Components of: CYBER SECURITY

42. Prepare checklist for reporting cyber crime at Cyber crime Police Station.
43. Prepare checklist for reporting cyber crime online and reporting phishing emails.
44. Prepare basic checklist, privacy and security settings for popular Social media platforms.
45. Reporting and redressal mechanism for violations and misuse of Social media platforms.
46. Perform configuration of security settings in Mobile Wallets and UPIs.
47. Prepare checklist for secure net banking.
48. Perform setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User).
49. Do setting and configuring two factor authentication in the Mobile phone.
50. Perform security patch management and updates in Computer and Mobiles.
51. Manage Application permissions in Mobile phone.
52. Installation and configuration of computer Anti-virus.
53. Installation and configuration of Computer Host Firewall.
54. Check Wi-Fi security management in computer and mobile.