

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS
SCHEME AND SYLLABUS OF EXAMINATION FOR

Bachelor (Honours/Honours with Research) of Physical Science / Bachelor of Arts

Duration 4 Years (8 Semesters) w.e.f. Academic Session 2023-24

Semester-V Scheme A										
Course Code	Course Title	Credit	L:T:P:C H	Internal Marks		External Marks		Total Marks		
				Th	Pr	Th	Pr	Th	Pr	Min
Major/Core Courses										
B23-CC-A5		4								
B23-CC-B5		4								
B23-CC-C5	Web Technologies	4	3:0:1:5	20	10	50	20	40	100	
Minor/Vocational Courses										
B23-CC-M5 (V)	Data Communication and Networking	4	3:0:1:5	20	10	50	20	40	100	
Multidisciplinary Courses										
Ability Enhancement Courses										
Skill Enhancement Courses										
B23-SEC9	Internship	4		0	50	0	50	40	100	
Value Added Courses										
Total		20								400

2014

Signature

Semester – VI Scheme A											
Course Code	Course Title	Credit	L:T:P:C H	Internal Marks		External Marks		Total Marks		Total Marks	
				Th	Pr	Th	Pr	Min	Max		
Major/Core Courses											
B23-CC-A6		4									
B23-CC-B6		4									
B23-CC-C6	Operating System	4	3:0:1:5	20	10	50	20	40	100		
Minor/Vocational Courses											
B23- CC-M6	Web Designing	4	3:0:1:5	20	10	50	20	40	100		
B23- CC-M7 (V)	AI in Day to Day Life	4	3:0:1:5	20	10	50	20	40	100		
Multidisciplinary Courses											
Ability Enhancement Courses											
Skill Enhancement Courses											
Value Added Courses											
Total		20		20							400

Sumit Kumar

B23-CC-C5
Web Technologies

Max. Marks:100

Internal Assessment Marks :30[Theory(20) + Practical(10)]

External End

Term Exam Marks:70[Theory(50)+Practical(20)]

Credit:4

Min. Pass Marks:40

Time: Theory(3Hours),Practical(3Hours)

Course Objectives:

1. Learn the basics of web development.
2. Understand different types of web pages and web sites.
3. Implement HTML and CSS for web page designing.
4. Understand the design of web crawlers and search engines.
5. To implement the programs based on various concepts of web development.

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

UNIT-I

Introduction to Internet and World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers; Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools. Web Publishing: Hosting website; Internet Service Provider; Planning and designing website; Web Graphics Design, Steps For Developing website

UNIT-II

Creating a Website and Introduction to Mark up Languages (HTML and DHTML), HTML Document Features & Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; Page layouts, Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5

UNIT-III

Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning and other useful Style Properties; Features of CSS3.

UNIT-IV

The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client-Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages.



(PRACTICUM)

Practicum:

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on HTML, CSS and Java Script during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/Lab records etc.:	-	5	
Mid-Term Exam	10	-	
Total	20	10	

Suggested Readings:

- Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
- Ramesh Bangia, Multimedia and Web Technology, Firewall Media.
- Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
- Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
- Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI
- David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
- Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.

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B23- CC-M5 (V)
Data Communication and Networking

Maximum marks: 70
Time: 3 hours

External: 50
Internal: 20
Credit: 4

Course Objectives:

1. *To understand the Computer Networks and various types.*
2. *To provide an overview OSI and TCP/IP Models.*
3. *To understand the Communication model and Switching.*
4. *To provide an overview of Data Link Layer and Wireless LAN protocol.*
5. *To understand the concept of Network layer, Routing and Scheduling.*

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 5 parts (objective type/short-answer type questions) covering the entire syllabus and will carry 10 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting One question from each Unit.

UNIT-I

Introduction to Computer Networks and its uses, Network categorization and Hardware: Broadcast and point-to-point networks, Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN), Internetworks, Topologies, Wireless networks, Network Software: Protocols, Services, network architecture, design issues, OSI Reference model, TCP/IP Reference model, Comparison of OSI and TCP/IP Models. Introduction to Example Networks: Internet, Connection-Oriented Networks – X.25, Frame Relay, ATM.

UNIT-II

Data Communication Model, Digital and Analog data and signals, bit rate, baud, bandwidth, Nyquist bit rate, Guided Transmission Media – Twisted Pair, Coaxial cable, Optical fiber; wireless transmission – Radio waves, microwaves, infrared waves; Satellite communication.

Switching: Circuit Switching, Packet Switching; Multiplexing: Frequency Division Multiplexing Time Division Multiplexing,



Synchronous and Asynchronous TDM, Modems, Transmission Impairments, Manchester and Differential Manchester encoding, ADSL Versus Cable.

UNIT-III

Data Link Layer Design issues: Framing, error control, Flow Control, Error Detection and correction; Elementary Data Link Protocols, Sliding Window Protocols; Medium Access Control: Aloha, CSMA protocols, Collision free protocols, Limited Contention Protocols; Wavelength division Multiple access protocol, Wireless LAN Protocol: MACA; IEEE 802.3 Ethernet, IEEE 802.4 Token Bus; IEEE 802.5 Token ring, Binary Exponential Backoff algorithm, Digital Cellular, Radio: Global System for Mobile Communication (GSM), Code Division Multiple Access(CDMA), Fiber Distributed Data Interface, Distributed Queue Dual Bus (DQDB).

UNIT-IV

Network Layer, Design issues, Virtual Circuit and Datagram Subnet, Routing Algorithms, Optimality principle, Shortest path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast and Multi Cast Routing, Routing for Mobile hosts, Routing in Adhoc Networks,, congestion Control Algorithms, General Principles Traffic Shaping, Leaky bucket token bucket, choke packets, Load Shedding.

(PRACTICUM)

Practicum:

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on Scheduling Algorithms, Memory Management and File System during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/Lab records etc.:	-	5	

Signature

Mid-Term Exam	10	-
Total	20	10

Suggested Readings:

1. Singh, B., " *Data Communication and Networking: Understanding Network Architecture, Design, and Management* ", BPB Publication, 1st Edition, 2024
2. Andrew S. Tanenbaum, " *Computer Networks* ", Pearson, 6th Edition, 2021
3. Behrouz A Forouzan, " *Introduction to Data communications and Networking* ", Tata Mc-Graw Hill, 4th Edition., 2013
4. Prakash C. Gupta, " *Data Communications and Computer Networks* ", PHI, 2006.

Forouzan

B23-CC6

Database Systems

Max. Marks:100
Min. Pass Marks:40
Time:
Theory(3Hours),Practical(3Hours)
Internal Assessment Marks :30[Theory(20) + Practical(10)]
External End Term Exam
Marks:70[Theory(50)+Practical(20)]
Credit:4

Course Objectives:

1. Learning basics of database systems.
2. Learning about E-R Model.
3. Learn querying the database systems.
4. To learn about data storage and retrieval.

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file Based Approach- Limitations of Traditional File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS.

UNIT – II

Actors on the Scene - Data and Database Administrator, Database Designers, End users Applications Developers and Workers behind the Scene.
Database System Architecture – Three Levels of Architecture, Schemas – External, Conceptual and Internal Level, Data Independence – Logical and Physical Data Independence.



UNIT – III

Entity-Relationship Model – Concepts, Entity Types, Entity Sets, Attributes, Relationships, Constraints, Keys , Degree, Cardinality etc.

Relational Data Model:-Brief History, Terminology in Relational Data Structure, Relations, Properties of Relations, Keys – Primary, Secondary, Composite, Candidate, Alternate and Foreign Key.

UNIT – IV

SQL: Data Definition and data types, Create Table, Insert Data, Viewing Data, Filtering Table Data, Sorting data, Creating Table from a Table, Destroy table, Update, View, Delete, Join, Concatenating data from Table Specifying Constraints in SQL; Primary Key, Foreign Key, Unique Key, Check Constraint, Using Functions

(PRACTICUM)

Practicum:

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on Scheduling Algorithms, Memory Management and File System during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theor y	Practicu m	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/Lab records etc.:	-	5	
Mid-Term Exam	10	-	
Total	20	10	

Suggested Readings:

- Elmasri Ramez & Navathe Shamkant B., “Fundamentals of Database Systems”, Addison & Weisely, New Delhi, 2007
- Date C.J., “Database Systems”, Prentice Hall of India, New Delhi, 2004
- Korth H.F. & Silverschatz A., “Database Concepts”, Tata McGraw Hill, New Delhi, 2010
- Thomas Connolly Carolyn Begg, “Database Systems”, 3/e, Pearson Education.



B23-CC-M6

Web Designing

Max. Marks: 100	Internal Assessment Marks : 30[Theory(20) + Practical(10)]
Min. Pass Marks: 40	External End Term Exam Marks: 70[Theory(50)+Practical(20)]
Time: Theory(3Hours), Practical(3Hours)	Credit: 4

Course Objectives:

1. Learn the basics of web development.
2. Understand different types of web pages and web sites.
3. Implement HTML and for web page designing.
4. Understand the design of web crawlers and search engines.

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic Features; Web Browsers; Web Servers; Hypertext Transfer Protocol; URLs; Searching and Web- Casting Techniques; Search Engines and Search Tools

UNIT – II

Steps for Developing Website; Choosing the Contents; Home Page; Domain Names; Internet Service Provider; Planning and Designing Web Site; Creating a Website; Web Publishing; Hosting Site;

UNIT-III

Introduction to HTML; Hypertext and HTML; HTML Document Features;



HTML Tags; Header, Title, Body, Paragraph, Ordered/Unordered Line, Creating Links; Headers; Text Styles; Text Structuring; Text Colors and Background; Formatting Text; Page layouts; Insertion of Text, Movement of Text

UNIT – IV

Images: Types of Images, Insertion of Image, Movement of Image, Ordered and Unordered lists; Inserting Graphics; Table Handling Functions like Columns, Rows, Width, Colours; Frame Creation and Layouts; Working with Forms and Menus; Working with Buttons like Radio, Check Box;

UNIT-V(PRACTICUM)

Practicum:

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on Scheduling Algorithms, Memory Management and File System during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/Lab record etc.:	-	5	
Mid-Term Exam	10	-	
Total	20	10	

Suggested Readings:

- Bayross Ivan, "Web Enabled Commercial Applications Development using HTML, Javascript, DHTML & PHP", BPB Publication, 2005
- Powell Thomas, "The Complete Reference HTML & CSS", Tat Mc-Graw Hill, 2010
- Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill
- Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

Amitha

B23- CC-M7 (V)
AI in Day to Day Life

External: 50
Internal: 20
Credit: 4

Maximum marks: 70
Time: 3 hours

Course Objectives:

1. *To understand the concept of Artificial Intelligence.*
2. *To know about various applications of AI.*
3. *To get familiar with AI Applications.*
4. *To understand AI and Its Ethical Usage in Day to Day Life.*

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 5 parts (objective type/short-answer type questions) covering the entire syllabus and will carry 10 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting One question from each Unit.

UNIT-I

What is AI? Basic concepts explained simply, AI vs. Human Intelligence, AI in historical and philosophical context, AI narratives in literature, cinema, and media.

Everyday applications: social media, recommendation systems, digital assistants; AI in governance: smart cities, predictive policing, e-governance, AI in education, healthcare, media, and cultural heritage; Social acceptance and resistance to AI

UNIT-II

AI in language and translation (Google Translate, ChatGPT); AI and creative industries (art, music, film, journalism); AI and cultural preservation (digitization, archives); Changing nature of human communication with AI

Bias and discrimination in AI, Privacy, surveillance, and data ethics, Algorithmic fairness and accountability, Philosophical debates: Can machines be moral?



UNIT-III

Impact on jobs and future of work, Automation in service and knowledge industries, Inequality: AI-rich vs. AI-poor societies, Global perspectives on AI-driven development

AI in legal decision-making and judiciary, Intellectual property and AI-generated content, International policies and AI governance (EU, India, US, China), Regulation, responsibility, and accountability of AI systems

UNIT-IV

AI in elections and political campaigns (microtargeting, deepfakes), AI, propaganda, and misinformation; Surveillance states vs. digital freedoms, AI and geopolitics (global competition in AI)

Human-AI collaboration: augmentation vs. replacement, AI in addressing social challenges (climate change, health crises, education gaps), Risks of AGI (Artificial General Intelligence), Imagining futures: utopian vs. dystopian AI

UNIT-V(PRACTICUM)

Practicum:

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on Scheduling Algorithms, Memory Management and File System during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/Lab record etc.:	-	5	
Mid-Term Exam	10	-	
Total	20	10	

Signature

Reference Books:

1. Data, A. (2025). *Zenith: Mastering AI for Everyday Life and Work*. Rupa Publications.
This is a practical guide by Indian innovator Dr. Ajay Data, showing how to apply AI tools in daily routines and work, grounded in the Indian context
2. Pandey, J. (2023). *AI Made Simple: A Beginner's Guide to Artificial Intelligence in Everyday Life*. Pothi Books.
3. Dandotiya, A. S., Gupta, S. K., Dandotiya, N., & Sharma, P. (2024). *AI in Everyday Life: Transforming Society* (1st ed.). Navi International Book Publication House.

