



Estd. 1962
"A++" Accredited by
NAAC (2021)
With CGPA 3.52

**SHIVAJI UNIVERSITY, KOLHAPUR - 416004,
MAHARASHTRA**

PHONE:EPABX-2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in

शिवाजी विद्यापीठ, कोल्हापूर - ४१६००४, महाराष्ट्र

दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दूरध्वनी ०२३१-२६०९०९४
०२३१-२६०९४८७



Ref.No.SU/BOS/Science/249

Date: 08/07/2026

The Head /Director/Co-ordinator
All Concerned Department (Science)
Shivaji University, Kolhapur.

Subject: Regarding Structure and syllabus of **B.Sc. Part I** under the Faculty of Science and Technology as per **Apprenticeship Embedded Degree Programme (AEDP)**.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the structure and syllabi, nature of question paper of **B.Sc. Part I** under the Faculty of Science & Technology as per **Apprenticeship Embedded Degree Programme (AEDP)**.

B.Sc. Part-I (Sem. I & II) as per AEDP			
1.	Cyber Security & Digital Forensics	3.	Biochemistry
2.	Digital Marketing and AI	4.	Biotechnology

This structure and syllabi shall be implemented from the academic year 2026- 2027 onwards. A soft copy containing structure and syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in>Syllabus>Syllabus as per NEP2020. This programme is introduce subject to approval of university authority for converted.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

Dy Registrar

**Encl: as above
for information and necessary action**

Copy to:

1	Dean, Faculty of Science & Technology	7	Appointment A & B Section
2	Director, Board of Examinations and Evaluation	8	I.T.Cell /Computer Centre
3	Chairman, Respective Board of Studies	9	Eligibility Section
4	B.Sc.-M.Sc. Exam Section	10	Affiliation (T.1) Section
5	Internal Quality Assurance Cell (IQAC Cell)	11	Affiliation (T.2) Section
6	Est PG Section	12	P.G. Seminar Section

SHIVAJI UNIVERSITY, KOLHAPUR



NAAC A++ Grade with CGPA 3.52

Multiple Entry and Multiple Exit Option (NEP-2020)

Syllabus for

B.Sc. Digital Marketing and Artificial Intelligence

(Apprenticeship Embedded Degree Programmes)

B.Sc. (DM & AI)(AEDP)

(Under Faculty of Science and Technology)

PART- I SEMESTER- I &II

(Syllabus to be implemented from Academic year 2026 - 2027)

B.Sc. Digital Marketing and Artificial Intelligence(AEDP)

1. Title: B.Sc. Digital Marketing and Artificial IntelligenceI (AEDP)
2. Year of Implementation: The syllabus shall be implemented from June 2026 onwards.
3. Duration: The duration of B.Sc. Digital Marketing and Artificial Intelligence(AEDP) is Three years (Six Semesters)
4. Pattern of Examination: Semester Pattern.

Shivaji University, Kolhapur

B.Sc. Digital Marketing and AI(DM & AI) (AEDP)

(Under Faculty of Science and Technology)

Program Outcomes

Upon successful completion of the **B.Sc. Digital marketing and Artificial Intelligence (DM & AI)** programme, the student should have met the following outcomes:

1. Apply concepts of Digital Marketing, Artificial Intelligence, Data Analytics, and Information Technology to solve business and marketing problems.
2. Ability to design, develop, and implement data-driven marketing strategies using digital platforms, tools, and AI technologies.
3. Apply analytical, statistical, and business intelligence techniques to evaluate customer behaviour, market trends, and campaign performance.
4. Utilize Artificial Intelligence, Machine Learning, Marketing Automation, and Digital Marketing tools to improve business processes and customer engagement.
5. Recognize the importance of innovation and develop critical thinking and research aptitude to address emerging challenges in Digital Marketing and Artificial Intelligence.
6. Recognize social, professional, legal, ethical, and cultural values and issues involved in the use of digital technologies, AI systems, and marketing practices.
7. Be self-motivated and enhance self-learning capabilities to adapt to emerging technologies, digital platforms, and evolving market trends.

Program Specific Outcome (PSO)

1. Apply knowledge of Digital Marketing, Artificial Intelligence, Data Analytics, and Computing to solve business and marketing problems across diverse domains.
2. Develop skills to analyze customer behaviour, market trends, digital campaigns, and business data using analytical, statistical, and AI-driven approaches.
3. Prepare for professional roles in Digital Marketing, Artificial Intelligence, Data Analytics, Business Intelligence, Content Strategy, Social Media Management, and related technology-driven industries.
4. Develop programming, data analysis, web analytics, digital marketing, and AI application skills using modern tools, platforms, and technologies.
5. Gain knowledge of various digital marketing platforms, AI tools, analytics tools, automation technologies, and emerging trends in Artificial Intelligence and Digital Marketing.
6. Identify, formulate, analyze, and solve business, marketing, and data-driven problems using appropriate computational, analytical, and Artificial Intelligence techniques and methodologies.
7. Develop entrepreneurial and self-employment capabilities in areas such as digital marketing consultancy, content creation, social media management, AI-assisted business solutions, and related technology sectors.
8. Pursue higher education, professional certifications, research, and careers in Artificial Intelligence, Digital Marketing, Data Analytics, Business Intelligence, Marketing Technology, and allied fields.
9. Understand contemporary issues, challenges, ethical considerations, and emerging trends in Artificial Intelligence, Digital Marketing, Data Analytics, and digital transformation, and innovate effective solutions to address evolving industry needs.

Programme Educational Objectives (PEOs)

The B.Sc. Digital Marketing and Artificial Intelligence (AEDP) programme aims to:

1. Develop competent professionals with strong foundations in Artificial Intelligence, Digital Marketing, Data Analytics, Computing, and emerging digital technologies to address real-world business and technological challenges.
2. Promote innovation, creativity, critical thinking, problem-solving abilities, and research aptitude for developing effective AI-driven and data-driven solutions in Digital Marketing, business intelligence, and digital transformation.
3. Encourage lifelong learning, professional growth, ethical practices, entrepreneurial mindset, and adaptability to emerging technologies, evolving market trends, and advancements in Artificial Intelligence and Digital Marketing.

1. Introduction

The B.Sc. Digital Marketing and Artificial Intelligence(AEDP) programme is designed to provide students with the knowledge, skills, and competencies required to meet the growing demands of the digital economy and technology-driven business environment. The programme focuses on developing a strong foundation in Artificial Intelligence, Digital Marketing, Data Analytics, Computing, Programming, Digital Technologies, and Business Intelligence.

Beginning with the fundamental concepts of Artificial Intelligence, Digital Marketing, Computing, Statistics, and Data Analytics, the programme enables students to understand and apply modern technologies, analytical techniques, and digital strategies through effective theoretical and practical learning. The curriculum is designed to equip students with the competencies required to analyze data, develop AI-assisted solutions, create and manage digital marketing campaigns, optimize business processes, and make data-driven decisions in diverse organizational settings.

The B.Sc. Digital Marketing and Artificial Intelligenceprogramme aims to prepare skilled professionals capable of addressing contemporary business and technological challenges in the areas of Artificial Intelligence, Digital Marketing, Data Analytics, Business Intelligence, and Digital Transformation. The programme also encourages innovation, creativity, ethical practices, problem-solving abilities, entrepreneurial thinking, and lifelong learning to help students adapt to emerging technologies, evolving market trends, and changing business requirements while pursuing careers in Artificial Intelligence, Digital Marketing, Data Analytics, Marketing Technology, Content Strategy, Business Intelligence, and related domains.

2. Multiple Entry and Multiple Exit Option (NEP-2020)

- After successful completion of the **First Year of B.Sc. Digital Marketing and Artificial Intelligence(DM & AI)**, the student can exit with an **Undergraduate Certificate in Digital Marketing and Artificial Intelligence**.
- After successful completion of the **Second Year of B.Sc. Digital Marketing and Artificial Intelligence(DM & AI)**, the student can exit with an **Undergraduate Diploma in Digital Marketing and Artificial Intelligence**.

- After successful completion of the **Third Year of B.Sc. Digital Marketing and Artificial Intelligence(DM & AI)**, the student can exit with a **B.Sc. Digital Marketing and Artificial IntelligenceDegree**.

3. Medium of Instruction: The medium of instruction will be English only

4. Admission Procedure

To be eligible for admission to the B.Sc. CS & DF a candidate must have:

HSC (Std. XII) (Science or Commerce) or equivalent (Science/Commerce) through the Maharashtra Board or any recognized Board.

OR

Must have passed HSC (Std. XII) vocational subjects conducted by Maharashtra State Board of Secondary & Higher Secondary Education

OR

MCVC (Engineering Technology Group) passed.

OR

Any 3 year Diploma after SSC

Course Structure:

Lectures and Practical should be conducted as per the scheme of lectures and practicals indicated in the course structure.

Teaching and Practical Scheme

- Each contact session for teaching 60 minutes each.
- One Practical Batch should be of 30 students.
- Practical evaluation should be conducted after the commencement of the University examination.

7. Project Work

- Project work may be done individually or in groups in case of bigger projects. However, if the project is done in groups, each student must be given responsibility for a distinct module, and care should be taken to ensure that the progress of individual modules is independent of others.

- b) Students should take guidance from the assigned guide and prepare a Project Report on "Project Work" in two copies to be submitted to the Head of the Department.
- c) The project report should contain an Introduction to the Project, which should clearly explain the project scope in detail. Appropriate diagrams, system architecture, database designs, workflow diagrams, AI models, marketing campaign frameworks, analytics dashboards, website structures, business process flows, and a list of outputs/reports generated should be included wherever applicable.
- d) The Project Work should be of such a nature that it could prove useful or should be relevant from the Artificial Intelligence, Digital Marketing, Data Analytics, commercial, industrial, entrepreneurial, or societal perspective.
- e) The project report will be duly assessed by the assigned guide and internal marks will be communicated by the Director of the Institute/Head of the Department.
- f) The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation. IEEE Computer Society templates are recommended in this regard.
- g) The external viva shall be conducted by a panel of minimum two examiners, out of which one will be an external examiner and the other will be an internal examiner.

8. Assessment

- a) The project will be evaluated by the university appointed examiners both internal as well as external.
- b) The final practical examination will be conducted by the university appointed examiners both internal as well as external at the end of semester for each lab course and marks will be submitted to the university by the panel.
- c) The practical examination will be conducted semester wise in order to maintain the relevance of the respective theory course with laboratory course.
- d) The final examinations shall be conducted at the end of the semester

Nature of question paper:**Internal Examination**

Year	Semester	Activity	Marks (2 Credits)
1	I & II	1. Home Assignment	5
		2. Quiz	5
		3. Presentation / Demonstration	5
		4. Midterm Test	5
Note:1.Midterm Test shall be conducted after completion of each unit			

Nature of question paper is as follows for University end semester examination

❖ Theory Examination:

Each paper will carry 30 Marks

1. Question No.1 is compulsory and is of multiple choice questions. There will be 6 multiple choice questions each carrying 1 mark
2. Question No.2 will have 3 questions out of which 2 questions need to be solved.
Each carries 6 Marks
3. Question No.3 will have 6 questions out of which 4 questions need to be solved.
Each carries 3 Marks

Practical Examination:

- 1 Each paper carries 30 Marks
- 2 Duration of Practical Examination: 2 Hrs
- 3 Nature of Question paper: There will be 3 questions out of which any 2 questions to be attempted and each question carries 15 Marks.
- 4 Internal Marks: 20(Journal :10 Marks, Internal Viva:10 Marks)
- 5 Practical evaluation should be conducted after the commencement of University examination by External examination.
- 6 Theory/Practical Exams of Open Elective will be conducted by Internal Evaluator

9. Standard of Passing:

- i) Minimum 40% marks in each subject. There shall be separate passing for theory and practical.
- ii) Admission to B.Sc. Digital Marketing and Artificial Intelligence(DM & AI) Part II is allowed even if the students fails in 20 subjects of First year B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)
- iii) Admission to B.Sc. Digital Marketing and Artificial Intelligence(DM & AI) part III is allowed even if the students fail in 20 subjects of B.Sc. Digital Marketing and AI(DM & AI)Part II. But no student is allowed to take admission to third year of B.Sc. Digital Marketing and Artificial Intelligence (DM & AI) unless they clears all the papers of first year.

1. Board of Paper Setters /Examiners:

For each Semester end examination there will be a board of Paper setters and examiners for every course. While appointing paper setter /examiners, care should be taken to see that there is at least one person specialized in each unit of the course.

2. Credit system implementation:

As per the University norms

3. Clarification of Syllabus:

The syllabus committee should meet at least once in a year to study and clarify any difficulties from the Institutes.

4. Revision of Syllabus:

As the computer technology experience rapid rate of obsolescence of knowledge, revision of the syllabus should be considered every two/three years.

5. Award of Class:

There will be numerical marking on each question. At the time of declaration of the result the marks obtained by the candidate is converted into grade point as shown below;

Grading: Shivaji University has introduced a Seven-point grading system as follows

Sr. No.	Marks Range out of 50	Grade Point	Letter grade
1.	40-50	10	O: Outstanding
2.	35-39	9	A+:Excellent
3.	30-34	8	A:Very Good
4.	28-29	7	B+:Good
5.	25-27	6	B: Above Average
6.	23-24	5	C:Average
7.	20-22	4	P:Pass
8.	0-19	0	F:Fail
9.	Absent	0	Ab: Absent

Multiple Entry and Multiple Exit Option (NEP-2020)
B.Sc. Digital Marketing and Artificial Intelligence (AEDP)
Programme Structure
B.Sc. Part-I (Level-4.5) Part – I Semester – I

SEMESTER-I (Duration-Six Month)								
Sr. No.	Course Code	Teaching Scheme			Examination Scheme			
		Theory and Practical			University Assessment(UA)		Internal Assessment (IA)	
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Maximum Marks	Minimum Marks
1	Subject I DSC I: Introduction to Artificial Intelligence	2	-	2	30	12	20	08
2	Subject I DSC II: Digital Marketing Fundamentals	2	-	2	30	12	20	08
3	Subject I Practical I: Practical based on Subject I DSC I	-	4	2	30	12	20	08
4	Subject II DSCI: Mathematics for Computing	2	-	2	30	12	20	08
5	Subject II DSC II: Fundamentals of Statistics	2	-	2	30	12	20	08
6	Subject II Practical I: Practical based on Subject II DSC I & Subject II DSC II	-	4	2	30	12	20	08
7	Subject III DSC I: Digital Electronics Fundamentals	2	-	2	30	12	20	08
8	Subject III DSC II: Fundamentals of Database Management Systems	2	-	2	30	12	20	08
9	Subject III Practical I: Practical based on Subject III DSC I & Subject III DSC II	-	4	2	30	12	20	08
10	OE I: Python Programming Fundamentals	-	4	2	30	12	20	08
11	IKS I :Vedic Mathematics	2	-	2	30	12	20	08
	Total (A)			22	330		220	

SEMESTER-II (Duration-Six Month)

Sr. No.	Course Code	Teaching Scheme			Examination Scheme			
		Theory and Practical			University Assessment (UA)		Internal Assessment(IA)	
		Lectures (Per week)	Hours (Per week)	Credit	Maximum Marks	Minimum Marks	Maximum Marks	Minimum Marks
1	Subject I DSC III: Fundamentals of Data Analytics	2	-	2	30	12	20	08
2	Subject I DSC IV: Web Analytics & Digital Marketing Metrics	2	-	2	30	12	20	08
3	Subject I Practical II: Practical based on Subject I DSC III	-	4	2	30	12	20	08
4	Subject II DSC III: Discrete Mathematics for Artificial Intelligence	2	-	2	30	12	20	08
5	Subject II DSC IV: Probability and Statistical Inference	2	-	2	30	12	20	08
6	Subject II Practical II: Practical based on Subject II DSC III & Subject II DSC IV	-	4	2	30	12	20	08
7	Subject III DSC III: Computer Hardware and System Maintenance	2	-	2	30	12	20	08
8	Subject III DSC IV: Applied Artificial Intelligence	2	-	2	30	12	20	08
9	Subject III Practical II: Practical based on Subject III DSC III and Subject III DSC IV	-	4	2	30	12	20	08
10	OE II : Basics of HTML	-	4	2	30	12	20	08
11	VEC I: Democracy, Election and Constitution	2	-	2	30	12	20	08
	Total (B)			22	330		220	
	Total (A+B)			44	660		440	

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I SEM I

Title of Course: Introduction to Artificial Intelligence

Course Outcomes

After completion of this course, students will be able to:

1. Understand the fundamental concepts, history, and applications of Artificial Intelligence.
2. Explain the role of Artificial Intelligence in business, marketing, healthcare, education, and other domains.
3. Identify different types of Artificial Intelligence and Machine Learning systems.
4. Apply basic AI concepts to solve simple real-world problems.
5. Explore AI tools and platforms used for productivity, content creation, and decision-making.
6. Recognize ethical, social, and legal implications of Artificial Intelligence technologies.

UNIT I

(15 HOURS)

Introduction to Artificial Intelligence

Definition and Scope of Artificial Intelligence, History and Evolution of AI, Characteristics of Intelligent Systems, AI and Human Intelligence, Applications of AI in Various Domains, Benefits and Limitations of AI, AI in Everyday Life.

Types of Artificial Intelligence

Narrow AI, General AI, Super AI, Reactive Machines, Limited Memory Systems, Theory of Mind, Self-Aware AI, Overview of Intelligent Agents and AI Systems.

Artificial Intelligence and Emerging Technologies

Introduction to Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, Robotics, Expert Systems, Virtual Assistants and Chatbots.

UNIT II

(15 HOURS)

AI Tools and Applications

Overview of AI Tools and Platforms, AI-Based Productivity Tools, AI for Content Creation, AI-Powered Search and Recommendation Systems, AI Applications in Digital Marketing and Business

Problem Solving Using AI

Introduction to AI-Based Decision Making, Pattern Recognition Concepts, Data and AI, Simple AI Workflows, AI-Assisted Problem Solving Approaches.

Ethics and Future of AI

Responsible AI, Ethical Issues in AI, Bias and Fairness, Privacy Concerns, Social Impact of AI, Future Trends in Artificial Intelligence, AI and Employment.

Reference Books

1. Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, Pearson.
2. Artificial Intelligence Foundations of Computational Agents, David Poole and Alan Mackworth, Cambridge University Press.
3. Artificial Intelligence for Humans, Jeff Heaton, Heaton Research.
4. Introduction to Artificial Intelligence, Wolfgang Ertel, Springer.
5. Artificial Intelligence Basics, Tom Taulli, Apress.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)
Multiple Entry and Multiple Exit Option (NEP-2020)
PART I SEM I
Title of Course: Digital Marketing Fundamentals

Course Outcomes

After completion of this course, students will be able to:

1. Understand the concepts, evolution, and significance of Digital Marketing in the modern business environment.
2. Differentiate between traditional marketing and digital marketing approaches.
3. Identify various digital marketing channels and platforms used for business promotion.
4. Apply digital marketing concepts to develop basic online marketing strategies.
5. Analyze the role of content, social media, websites, and search engines in digital marketing.
6. Recognize emerging trends, opportunities, and ethical considerations in Digital Marketing.

UNIT I

(15 HOURS)

Introduction to Digital Marketing

Concept and Scope of Digital Marketing, Evolution of Marketing, Traditional Marketing vs Digital Marketing, Importance and Benefits of Digital Marketing, Digital Marketing Ecosystem, Customer Journey and Digital Consumer Behaviour.

Digital Marketing Channels

Website Marketing, Search Engine Marketing Overview, Social Media Marketing Overview, Email Marketing Overview, Mobile Marketing Overview, Video Marketing Overview, Affiliate Marketing Overview.

Digital Presence and Branding

Online Branding Concepts, Personal Branding, Business Branding, Digital Identity, Online Reputation Management, Introduction to Digital Marketing Campaigns.

UNIT II

(15 HOURS)

Content and Social Media Marketing

Introduction to Content Marketing, Types of Digital Content, Content Planning and Strategy, Introduction to Social Media Platforms, Social Media Engagement and Community Building.

Search Engines and Website Fundamentals

Introduction to Search Engines, Basics of Search Engine Optimization (SEO), Keywords and Search Behaviour, Importance of Websites in Digital Marketing, Website Structure and User Experience

Emerging Trends and Ethics in Digital Marketing

Artificial Intelligence in Digital Marketing, Marketing Automation Overview, Influencer Marketing, Ethical Issues in Digital Marketing, Data Privacy and Consumer Protection, Future Trends in Digital Marketing.

Reference Books

1. Digital Marketing, Seema Gupta, McGraw Hill.
2. Digital Marketing Strategy, Simon Kingsnorth, Kogan Page.
3. Fundamentals of Digital Marketing, Google Digital Garage.
4. Digital Marketing Essentials, Jeff Larson and Stuart Draper, Stukent Publications.
5. Marketing 5.0: Technology for Humanity, Philip Kotler, Hermawan Kartajaya and Iwan Setiawan.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Mathematics for Computing

Course Outcomes

After completion of this course, students will be able to:

1. Understand fundamental mathematical concepts used in computing and information technology.
2. Apply number systems and binary arithmetic in computational problems.
3. Analyze sets, functions, and logical statements used in programming and algorithm design.
4. Perform matrix operations and understand their applications in computing and artificial intelligence.
5. Apply counting techniques to solve problems related to algorithms, Digital Marketing, and data analysis.
6. Understand the applications of graphs and trees in computer networks, Digital Marketing, and artificial intelligence.

UNIT I

(15 HOURS)

Number Systems and Mathematical Logic

Decimal, Binary, Octal and Hexadecimal Number Systems, Interconversion of Number Systems, Binary Arithmetic, Signed and Unsigned Numbers, Applications of Number Systems in Computing.

Sets and Functions

Sets and Set Operations, Venn Diagrams, Cartesian Product, Functions and Types of Functions, Applications of Sets and Functions in Computing.

Mathematical Logic

Statements and Propositions, Logical Connectives, Truth Tables, Tautology, Contradiction, Logical Equivalence, Applications of Logic in Programming and Algorithm Design.

UNIT II

(15 HOURS)

Matrices and Computational Applications

Introduction to Matrices, Types of Matrices, Matrix Addition, Matrix Multiplication, Transpose of Matrix, Applications of Matrices in Computing, Data Analytics and Artificial Intelligence.

Counting Techniques

Fundamental Principle of Counting, Permutations, Combinations, Applications of Counting Techniques in Algorithms and Digital Marketing.

Graphs and Trees

Introduction to Graphs, Graph Terminology, Types of Graphs, Graph Representation, Introduction to Trees, Applications of Graphs and Trees in Computer Networks, Digital Marketing and Artificial Intelligence.

Reference Books

1. Discrete Mathematics and Its Applications – Kenneth H. Rosen.
2. Discrete Mathematical Structures – Tremblay and Manohar.
3. Mathematical Foundations of Computer Science – Judith L. Gersting.
4. Discrete Mathematics for Computer Scientists – Joe L. Mott, Abraham Kandel and Theodore P. Baker.
5. Higher Engineering Mathematics – B.S. Grewal.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Fundamentals of Statistics

Course Outcomes

After completion of this course, students will be able to:

1. Understand fundamental statistical concepts and their role in Computing, Digital Marketing, Artificial Intelligence, and Data Analytics.
2. Organize, summarize, and present data using appropriate tabular, diagrammatic, and graphical techniques.
3. Compute and interpret measures of central tendency for effective data analysis and decision-making.
4. Calculate and analyze measures of dispersion to understand variability and consistency in datasets.
5. Apply correlation techniques to study relationships between variables and interpret statistical results.
6. Understand basic probability concepts and apply statistical methods to support data-driven decision-making.

UNIT I

(15 HOURS)

Introduction to Statistics and Data Presentation

Introduction to Statistics, Types of Data, Sources of Data, Collection of Data, Classification and Tabulation of Data, Frequency Distribution, Diagrammatic and Graphical Representation of Data, Bar Diagrams, Pie Charts, Histogram, Frequency Polygon and Ogive Curves.

Measures of Central Tendency

Arithmetic Mean, Median, Mode, Weighted Mean, Applications of Measures of Central Tendency in Computing, Digital Marketing, and Data Analysis.

UNIT II

(15 HOURS)

Measures of Dispersion

Range, Quartile Deviation, Mean Deviation, Standard Deviation, Variance, Coefficient of Variation, Applications of Dispersion Measures in Data Analysis

Correlation and Introduction to Probability

Concept of Correlation, Types of Correlation, Karl Pearson's Correlation Coefficient, Scatter Diagram, Introduction to Probability, Random Experiments, Sample Space, Events, Concept of Probability, Applications of Probability in Data Analysis and Artificial Intelligence.

Reference Books

1. Fundamentals of Statistics – S. C. Gupta.
2. Fundamentals of Applied Statistics – S. C. Gupta and V. K. Kapoor.
3. Business Statistics – S. P. Gupta.
4. Statistics for Management – Levin and Rubin.
5. Introduction to Probability and Statistics – Sheldon Ross.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Practical based on Subject II DSC I & Subject II DSC II

Course Outcomes

After completion of this course students will be able to:

1. Apply mathematical concepts used in computing through practical problem solving.
2. Perform number system conversions and logical operations using computational tools.
3. Utilize matrices and graph concepts for computing applications.
4. Apply statistical techniques for data organization and analysis.
5. Interpret and visualize data using spreadsheet software and programming tools.
6. Use appropriate software tools for mathematical and statistical computations.

Lab Work

Lab work is based on Mathematics for Computing and Fundamentals of Statistics. The practical course shall consist of exercises using Python IDLE, MS Excel / LibreOffice Calc, Draw.io, and other suitable computational tools.

Part A: Mathematics for Computing (10 Practicals)

Practical No.	Practical Title	Tool Used
1	Perform number system conversions (Binary, Decimal, Octal, Hexadecimal)	Python IDLE
2	Perform binary arithmetic operations	Python IDLE
3	Demonstrate set operations and Venn diagrams	Draw.io / Online Venn Diagram Tool
4	Construct truth tables for logical expressions	MS Excel
5	Verify logical connectives and logical equivalence	Python IDLE
6	Implement relations and functions for simple datasets	Python IDLE
7	Perform matrix addition and subtraction	MS Excel
8	Perform matrix multiplication	MS Excel
9	Plot and analyze simple functions and their graphs	MS Excel / Python IDLE
10	Represent simple graphs and trees	Draw.io

Part B: Fundamentals of Statistics (10 Practicals)

Practical No.	Practical Title	Tool Used
1	Perform number system conversions (Binary, Decimal, Octal, Hexadecimal)	Python IDLE

2	Perform binary arithmetic operations	Python IDLE
3	Demonstrate set operations and Venn diagrams	Draw.io / Online Venn Diagram Tool
4	Construct truth tables for logical expressions	MS Excel
5	Verify logical connectives and logical equivalence	Python IDLE
6	Implement relations and functions for simple datasets	Python IDLE
7	Perform matrix addition and subtraction	MS Excel
8	Perform matrix multiplication	MS Excel
9	Plot and analyze simple functions and their graphs	MS Excel / Python IDLE
10	Represent simple graphs and trees	Draw.io

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Digital Electronics Fundamentals

Course Outcomes

After completion of this course, students will be able to:

1. Understand the concepts of digital systems and number systems.
2. Perform conversions among binary, decimal, octal, and hexadecimal number systems.
3. Apply binary arithmetic and complement techniques in digital computations.
4. Analyze the operation of logic gates and Boolean algebra.
5. Simplify Boolean expressions using Boolean laws and Karnaugh Maps.
6. Understand the fundamentals of combinational digital circuits used in computing systems.

UNIT I

(15 HOURS)

Number Systems and Digital Codes: Introduction to Digital Electronics, Analog and Digital Signals, Decimal, Binary, Octal and Hexadecimal Number Systems, Interconversion of Number Systems, Binary Arithmetic, Signed and Unsigned Numbers, 1's and 2's Complement, Binary Codes, Gray Code, Excess-3 Code, ASCII Code, EBCDIC Code, Parity Bit and Error Detection Concepts.

UNIT II

(15 HOURS)

Logic Gates and Boolean Algebra: AND, OR, NOT, NAND, NOR, XOR and XNOR Gates, Symbols, Truth Tables and Applications, Boolean Algebra and Boolean Laws, De Morgan's Theorems, Universal Gates (NAND and NOR), Simplification of Boolean Expressions, Karnaugh Maps (K-Maps), Introduction to Combinational Logic Circuits, Half Adder, Full Adder, Multiplexer and Decoder.

Reference Books

1. Digital Fundamentals – Thomas L. Floyd.
2. Digital Logic and Computer Design – M. Morris Mano.
3. Fundamentals of Digital Circuits – A. Anand Kumar.
4. Digital Electronics – S. Salivahanan and S. Arivazhagan.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Fundamentals of Database Management Systems

Course Outcomes

After completion of this course, students will be able to:

1. Understand the concepts and importance of database systems in modern computing environments.
2. Explain database architecture, data models, and database users.
3. Design Entity Relationship (ER) diagrams and convert them into relational schemas.
4. Apply relational database concepts, keys, and integrity constraints.
5. Write SQL statements for data definition, manipulation, and retrieval.
6. Understand database security concepts and the role of databases in Cyber Security

UNIT I

(15 HOURS)

Introduction to Database Systems: Introduction to Database Systems, Need and Advantages of DBMS, File Processing System versus DBMS, Characteristics of Database Approach, Database Environment, Database Users and Database Administrator (DBA), Three-Schema Architecture, Database Languages (DDL, DML, DCL, TCL), Applications of Database Systems.

Data Models and Database Design: Data Models, Entity-Relationship (ER) Model, Entities, Attributes and Relationships, ER Diagrams, Mapping Cardinalities, Relational Data Model, Relational Schema, Keys (Primary Key, Candidate Key, Alternate Key, Foreign Key), Integrity Constraints, Introduction to Normalization (1NF, 2NF and 3NF).

UNIT II

(15 HOURS)

Structured Query Language (SQL): Introduction to SQL, Data Definition Language (DDL), Data Manipulation Language (DML), Data Control Language (DCL), Creating Databases and Tables, INSERT, UPDATE and DELETE Commands, SELECT Statement, WHERE Clause, ORDER BY Clause, DISTINCT Clause, Aggregate Functions (COUNT, SUM, AVG, MIN, MAX).

Database Security and Applications: Database Security Concepts, User Privileges and Access Control, Backup and Recovery Concepts, Introduction to Transactions, Applications of Databases in Cyber Security, Digital Forensics, Log Management, Security Monitoring Systems and Information Retrieval.

Reference Books

1. Database System Concepts – Abraham Silberschatz, Henry F. Korth and S. Sudarshan.
2. Fundamentals of Database Systems – Ramez Elmasri and Shamkant Navathe.
3. Database Management Systems – Raghu Ramakrishnan and Johannes Gehrke.
4. SQL, PL/SQL: The Programming Language of Oracle – Ivan Bayross.
5. Database Systems: Design, Implementation and Management – Carlos Coronel and Steven Morris.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER I

Title of Course: Practical based on Subject III DSC I & Subject III DSC II

Course Outcomes

After completion of this course students will be able to:

1. Apply concepts of Digital Electronics using hardware and simulation tools.
2. Design and analyze basic digital logic circuits.
3. Implement Boolean expressions and logic gate combinations.
4. Develop Python programs using appropriate programming constructs.
5. Apply file handling and exception handling techniques in Python applications.
6. Solve simple computational and data processing problems using Python programming.

Lab Work

Lab work is based on Digital Electronics Fundamentals and Fundamentals of Database Management Systems. The practical course shall consist of exercises using Digital Electronics Simulation Tools (CircuitVerse, Logisim, Proteus, Multisim, Tinkercad Circuits) and DBMS tools such as MySQL, SQLite, PostgreSQL or equivalent open-source database systems.

Part A: Digital Electronics Fundamentals (10 Practicals)

Practical No.	Practical Title	Tool Used
1	Verification of basic logic gates (AND, OR, NOT)	Hardware Kit / CircuitVerse
2	Verification of NAND and NOR gates	Hardware Kit / CircuitVerse
3	Verification of XOR and XNOR gates	Hardware Kit / CircuitVerse
4	Realization of basic gates using NAND gates	Hardware Kit / Logisim
5	Realization of basic gates using NOR gates	Hardware Kit / Logisim
6	Verification of De Morgan's Theorem	Hardware Kit / CircuitVerse
7	Simplification and implementation of Boolean expressions	Logisim / CircuitVerse

8	Design and implementation of Half Adder	Hardware Kit / Logisim
9	Design and implementation of Full Adder	Hardware Kit / Logisim
10	Design and implementation of Multiplexer and Decoder circuits	Hardware Kit / Logisim

Part B: Fundamentals of Database Management Systems (10 Practicals)

Practical No.	Practical Title	Tool Used
11	Installation and configuration of MySQL/SQLite	MySQL / SQLite
12	Create a database and tables using DDL commands	MySQL
13	Perform INSERT operations on tables	MySQL
14	Perform UPDATE and DELETE operations	MySQL
15	Retrieve records using SELECT statements	MySQL
16	Use WHERE, ORDER BY and DISTINCT clauses	MySQL
17	Apply aggregate functions (COUNT, SUM, AVG, MIN, MAX)	MySQL
18	Implement Primary Key and Foreign Key constraints	MySQL
19	Create simple relational database schema for a real-world application	MySQL
20	Mini database project involving table creation, data insertion and report generation	MySQL

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

Title of Course: Python Programming Fundamentals

Course Outcomes

After completion of this course, students will be able to:

1. Understand the fundamental concepts, features, and applications of Python programming.
2. Apply variables, operators, expressions, and data types to develop Python programs.
3. Implement decision-making and iterative control structures for problem solving.
4. Utilize strings, functions, and exception handling mechanisms in Python.
5. Perform file handling operations for reading, writing, and processing data.
6. Develop simple Python programs for computational and data processing tasks.

There will be around 30 practicals based on fundamental concepts in python programming

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Vedic Mathematics

Course Outcomes: After completion of this course students will be able;

1. To perform simple arithmetic calculations with speed and accuracy.
2. To generate tables of any number.
3. To perform products of large numbers quickly.
4. Apply basic Vedic techniques for fast addition, subtraction, multiplication, and division.
5. Use complements, bases, and vinculum numbers to simplify arithmetic calculations.
6. Solve quadratic and simultaneous equations and apply Vedic techniques to competitive exam problems.

UNIT I

(15 HOURS)

Introduction to Vedas, History of Vedas History and Evolution of Vedic Mathematics Introduction of Basic Vedic Mathematics Techniques in Multiplication (Special Case, Series of 9, Series of 1 etc.), Tables etc., Various techniques to carry out basic operations covering Addition, Subtraction, Multiplication, Division, Complements and Bases, Vinculum number. Comparison of Standard Methods with Vedic Methods.

UNIT II

(15 HOURS)

General multiplication (Vertically Cross- wise), Multiplications by numbers near base. Verifying answers by use of digital roots, Divisibility tests, Division of numbers near base, Comparison of fractions. Different methods of Squares (General method, Base method, Duplex method etc.) Cubes, Cube roots, Square Roots, General division. Quadratic Equations, Simultaneous Equations, Use of various Vedic Techniques for answering numerical aptitude questions from Competitive Examinations

Reference Books:

1. Bhatiya Dhaval, Vedic Mathematics Made Easy, Jaico Publishing House.
2. Thakur Rajesh Kumar, Vedic Mathematics for students taking Competitive Examinations. Unicorn Books 2015 or Later Edition.
3. Gupta Atul, Power of Vedic Mathematics with Trigonometry, JaicoBooks
4. V. G. Unkalkar, Magical World of Mathematics (Vedic Mathematics), Vandana Publishers, Bangalore.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Fundamentals of Data Analytics

Course Outcomes

After completion of this course, students will be able to:

1. Understand the concepts, importance, and applications of Data Analytics.
2. Identify different types of data and analytics used in business and digital environments.
3. Apply data collection, cleaning, and preprocessing techniques.
4. Perform exploratory data analysis using appropriate tools and techniques.
5. Interpret data using visualization methods and statistical summaries.
6. Apply data analytics concepts to support decision-making in Artificial Intelligence and Digital Marketing.

UNIT I

(15 HOURS)

Introduction to Data Analytics

Data, Information and Knowledge, Introduction to Data Analytics, Importance and Applications of Data Analytics, Analytics in Business and Digital Marketing, Types of Analytics: Descriptive, Diagnostic, Predictive and Prescriptive Analytics

Data Collection and Preparation

Sources of Data, Structured and Unstructured Data, Data Collection Methods, Data Quality Issues, Data Cleaning, Data Transformation, Data Preparation Techniques

Data Analytics Tools

Introduction to Spreadsheet Analytics, MS Excel for Data Analysis, Introduction to Python for Data Analytics, Overview of Data Analytics Platforms and Tools

UNIT II

(15 HOURS)

Exploratory Data Analysis

Introduction to Exploratory Data Analysis (EDA), Data Summarization, Measures of Central Tendency and Dispersion in Analytics, Identifying Patterns and Trends in Data.

Data Visualization

Importance of Data Visualization, Tables and Charts, Bar Charts, Pie Charts, Histograms, Line Charts, Dashboards, Visualization Best Practices.

Applications of Data Analytics

Data Analytics in Business Decision Making, Customer Analytics, Marketing Analytics, Social Media Analytics, Introduction to AI-Driven Analytics and Future Trends

Reference Books

1. Data Analytics Made Accessible – Anil Maheshwari.
2. Data Analytics for Business – Foster Provost and Tom Fawcett.
3. Business Analytics – James Evans.
4. Practical Data Analytics – Hector Cuesta.
5. Data Science for Business – Foster Provost and Tom Fawcett.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Web Analytics & Digital Marketing Metrics

Course Outcomes

After completion of this course, students will be able to:

1. Understand the concepts and importance of Web Analytics in Digital Marketing.
2. Identify and interpret key website and digital marketing performance metrics.
3. Analyze user behaviour and website traffic using web analytics tools.
4. Evaluate the effectiveness of digital marketing campaigns using appropriate metrics and KPIs.
5. Generate and interpret web analytics reports for decision-making.
6. Apply web analytics concepts to improve website performance, user engagement, and marketing outcomes.

UNIT I

(15 HOURS)

Introduction to Web Analytics

Introduction to Web Analytics, Importance of Web Analytics, Role of Web Analytics in Digital Marketing, Website Traffic Measurement, Key Terminologies: Users, Sessions, Page Views, Unique Visitors, Bounce Rate, Exit Rate, Conversion Rate.

Website Traffic Sources

Direct Traffic, Organic Traffic, Referral Traffic, Social Traffic, Paid Traffic, Campaign Traffic, Understanding Traffic Acquisition Channels.

User Behaviour Analysis

User Journey, User Engagement Metrics, Landing Pages, Exit Pages, Session Duration, Click Behaviour, Website Performance Indicators.

UNIT II

(15 HOURS)

Digital Marketing Metrics and KPIs

Key Performance Indicators (KPIs), Reach, Impressions, Clicks, Click Through Rate (CTR), Cost Per Click (CPC), Cost Per Acquisition (CPA), Return on Investment (ROI), Conversion Metrics.

Web Analytics Tools

Introduction to Google Analytics, Google Search Console, Website Performance Monitoring Tools, Dashboard and Report Generation, Basic Report Interpretation.

Applications of Web Analytics

Campaign Performance Analysis, Social Media Analytics Overview, Content Performance Analysis, Website Optimization Strategies, Data-Driven Decision Making in Digital Marketing.

Reference Books

1. Web Analytics 2.0 – Avinash Kaushik.
2. Digital Marketing Analytics – Chuck Hemann and Ken Burbary.
3. Advanced Web Metrics with Google Analytics – Brian Clifton.
4. Digital Marketing Strategy – Simon Kingsnorth.
5. Measuring the Success of Digital Marketing – Kevin Hartman.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Practical based on Subject I DSC III

Course Outcomes

After completion of this course students will be able to:

1. Collect, organize, and preprocess data for analysis.
2. Apply spreadsheet and Python-based tools for data analysis.
3. Perform exploratory analysis using statistical summaries.
4. Create charts and visualizations to represent data effectively.
5. Interpret analytical results for business and marketing applications.
6. Develop basic data-driven decision-making skills using analytics tools.

Lab Work

Lab work is based on Fundamentals of Data Analytics. The practical course shall consist of exercises using MS Excel / LibreOffice Calc and Python IDLE.

Suggested List of Practicals

Practical No.	Practical Title	Tool Used
1	Create and organize datasets using spreadsheets	MS Excel / LibreOffice Calc
2	Perform data sorting and filtering operations	MS Excel / LibreOffice Calc
3	Identify and handle missing or inconsistent data values	MS Excel / LibreOffice Calc
4	Calculate statistical measures such as Mean, Median and Mode	MS Excel / Python
5	Calculate Range, Variance and Standard Deviation	MS Excel / Python
6	Create frequency distribution tables	MS Excel
7	Generate bar charts and pie charts for data visualization	MS Excel
8	Generate histograms and line charts	MS Excel
9	Perform exploratory analysis on a sample business dataset	MS Excel
10	Create summary reports using spreadsheet functions	MS Excel
11	Read and display data using Python programs	Python IDLE
12	Perform basic calculations on datasets using Python	Python IDLE
13	Analyze student or sales data using Python lists and dictionaries	Python IDLE
14	Find maximum, minimum and average values from	Python IDLE

	datasets using Python	
15	Perform simple data cleaning operations using Python	Python IDLE
16	Create Python programs for frequency counting and categorization	Python IDLE
17	Generate simple business analytics reports using Python	Python IDLE
18	Analyze customer or marketing datasets using Python	Python IDLE
19	Mini case study using spreadsheet analytics	MS Excel
20	Mini project involving data analysis, visualization and interpretation	MS Excel / Python

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Discrete Mathematics for Artificial Intelligence

Course Outcomes

After completion of this course, students will be able to:

1. Apply propositional and predicate logic in Digital Marketing problem solving.
2. Analyze mathematical structures used in computing and Data Analytics.
3. Apply counting techniques and recurrence relations in algorithm analysis.
4. Understand graph theoretic concepts used in computer networks and Digital Marketing.
5. Apply modular arithmetic concepts used in cryptographic systems.
6. Utilize discrete mathematical concepts in Digital Marketing and AI applications.

Logic and Mathematical Structures

Propositional Logic, Predicate Logic, Logical Equivalence, Normal Forms (CNF and DNF), Rules of Inference, Proof Techniques, Mathematical Induction, Recursive Definitions and Recurrence Relations.

Relations and Algebraic Structures

Properties of Relations, Equivalence Relations, Partial Ordering Relations, Introduction to Algebraic Structures, Groups, Semigroups and Monoids, Applications in Computing and Data Analytics.

UNIT II

(15 HOURS)

Modular Arithmetic and Cryptographic Foundations

Divisibility, Prime Numbers, Greatest Common Divisor (GCD), Euclidean Algorithm, Modular Arithmetic, Congruence Relations, Applications of Modular Arithmetic in Cryptography.

Graph Theory and Digital Marketing Applications

Graph Terminology, Directed and Undirected Graphs, Connected Graphs, Trees and Spanning Trees, Graph Traversal Concepts, Applications of Graph Theory in Computer Networks, Digital Marketing, Attack Graphs and Network Analysis.

Reference Books

1. Discrete Mathematics and Its Applications – Kenneth H. Rosen.
2. Discrete Mathematical Structures – Tremblay and Manohar.
3. Elements of Discrete Mathematics – C.L. Liu.
4. Discrete Mathematics for Computer Scientists – Joe L. Mott, Abraham Kandel and Theodore P. Baker.
5. Applied Discrete Structures – Alan Doerr and Kenneth Levasseur.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Probability and Statistical Inference

Course Outcomes

After completion of this course, students will be able to:

1. Understand fundamental concepts of probability and uncertainty.
2. Apply probability distributions to real-world problems in Computing, Artificial Intelligence, and Digital Marketing.
3. Analyze data using basic statistical and probabilistic techniques.
4. Interpret patterns, trends, and relationships in datasets.
5. Apply statistical methods for data-driven decision-making.
6. Understand the role of probability and statistical inference in Artificial Intelligence, Data Analytics, and Digital Marketing.

UNIT I

(15 HOURS)

Probability Fundamentals

Random Experiments, Sample Space, Events, Types of Events, Classical Definition of Probability, Addition Law of Probability, Conditional Probability, Multiplication Law of Probability, Independent Events, Bayes' Theorem, Applications of Probability in Computing, Artificial Intelligence, and Digital Marketing.

Random Variables and Probability Distributions

Concept of Random Variable, Discrete and Continuous Random Variables, Probability Mass Function (PMF), Probability Density Function (PDF), Mean and Variance of a Random Variable.

Probability Distributions

Binomial Distribution, Mean and Variance of Binomial Distribution, Poisson Distribution, Mean and Variance of Poisson Distribution, Normal Distribution, Standard Normal Distribution, Applications of Probability Distributions in Data Analytics and Artificial Intelligence.

UNIT II

(15 HOURS)

Statistical Inference

Population and Sample, Sampling Techniques, Sampling Distribution, Estimation Concepts, Introduction to Statistical Inference, Confidence Intervals and their Interpretation1. Hypothesis Testing

Introduction to Hypothesis Testing, Null and Alternative Hypothesis, Level of Significance, Types of Errors, Basic Concepts of Statistical Decision Making.

Applications of Statistical Inference

Data Visualization for Analytics, Pattern Recognition Concepts, Introduction to Predictive Analytics, Applications of Statistical Inference in Artificial Intelligence, Digital Marketing, Business Analytics, and Data-Driven Decision Making.

Reference Books

1. Fundamentals of Applied Statistics – S. C. Gupta and V. K. Kapoor.
2. Introduction to Probability and Statistics – Sheldon Ross.
3. Probability and Statistics for Computer Science – James L. Johnson.
4. Business Statistics – S. P. Gupta.
5. Statistics for Management – Levin and Rubin.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Practical based on Subject II DSC III & Subject II DSC IV

Course Outcomes

After completion of this course students will be able to:

1. Apply discrete mathematical concepts to computing and Artificial Intelligence problems.
2. Implement logical and mathematical operations using computational tools.
3. Analyze probability distributions and statistical measures.
4. Visualize and interpret business, marketing, and analytics datasets.
5. Apply analytical techniques for identifying patterns, trends, and relationships in datasets.
6. Use Python, Excel, and Weka for data analytics and statistical analysis applications.

Lab Work

Lab work is based on **Discrete Mathematics for AI** and **Probability and Statistical Inference**. The practical course shall consist of exercises using Python IDLE, MS Excel, Weka, Draw.io, and other suitable analytical tools.

Part A: Discrete Mathematics for AI (10 Practicals)

Practical No.	Practical Title	Tool Used
1	Construct truth tables for logical expressions	MS Excel
2	Verify logical equivalence of propositions	Python IDLE
3	Implement logical operators and Boolean expressions	Python IDLE
4	Demonstrate set operations and relations	Python IDLE
5	Implement functions and mappings for sample datasets	Python IDLE
6	Solve recursive problems using recursion	Python IDLE
7	Implement modular arithmetic operations	Python IDLE
8	Compute GCD using Euclidean Algorithm	Python IDLE

9	Represent graphs and network structures	Draw.io
10	Construct and analyze trees for hierarchical structures	Draw.io

Part B: Probability and Statistical Inference (10 Practicals)

Practical No.	Practical Title	Tool Used
11	Calculate probability of simple events	Python IDLE
12	Calculate conditional probability and independent events	Python IDLE
13	Implement Bayes' Theorem for business, marketing, and decision-making scenarios	Python IDLE
14	Generate frequency distributions and statistical summaries	MS Excel
15	Calculate Mean, Median and Mode for business and marketing datasets	MS Excel
16	Calculate Variance and Standard Deviation	MS Excel
17	Visualize business and marketing data using charts and graphs	MS Excel
18	Preprocess and explore business, customer, or marketing datasets	Weka
19	Perform basic data classification using Weka	Weka
20	Mini Case Study: Analyze a business, customer, or marketing dataset and prepare an analytical report	Python IDLE / MS Excel / Weka

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Computer Hardware and System Maintenance

Course Outcomes

After completion of this course, students will be able to:

1. Understand the architecture and components of computer systems.
2. Identify the functions of various hardware devices and peripherals.
3. Explain memory organization and storage technologies.
4. Understand computer assembly and hardware installation procedures.
5. Perform basic troubleshooting and preventive maintenance of computer systems.
6. Apply hardware maintenance practices for efficient system operation.

UNIT I

(15 HOURS)

Computer System Architecture

Introduction to Computer Hardware, Functional Units of a Computer System, Motherboard Components, Central Processing Unit (CPU), Arithmetic Logic Unit (ALU), Control Unit, Registers, System Bus, Input and Output Devices, Ports and Connectors, Power Supply Unit (SMPS).

Memory and Storage Devices

Primary Memory (RAM, ROM, Cache Memory), Secondary Storage Devices (Hard Disk Drive, Solid State Drive, Optical Storage Devices), Storage Hierarchy, Memory Organization, Data Storage Concepts, Backup Devices.

UNIT II

(15 HOURS)

Computer Assembly and Peripheral Devices

Computer Assembly Concepts, Installation of Hardware Components, Expansion Cards, Printers, Scanners, Monitors, Keyboards, Mouse and Other Peripheral Devices, Device Drivers and Plug-and-Play Concepts.

System Maintenance and Troubleshooting

Preventive Maintenance, Hardware Diagnostics, Common Hardware Problems and Troubleshooting Techniques, Booting Process, BIOS and UEFI Concepts, System Configuration, Data Backup Practices, Safety Measures during Hardware Maintenance.

Reference Books

1. PC Hardware: A Beginner's Guide – Ron Gilster.
2. Upgrading and Repairing PCs – Scott Mueller.
3. Computer Hardware and Networking – B.B. Gupta.
4. Computer Fundamentals and Hardware – P.K. Sinha.
5. A+ Guide to Hardware – Jean Andrews.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Applied Artificial Intelligence

Course Outcomes

After completion of this course, students will be able to:

1. Understand the practical applications of Artificial Intelligence in various domains.
2. Identify AI-powered systems and tools used in business and digital environments.

3. Apply AI concepts to solve simple real-world problems.
4. Analyze the role of AI in Digital Marketing, customer engagement, and decision-making.
5. Utilize AI-based tools for productivity, automation, and content generation.
6. Recognize ethical, social, and legal issues associated with Artificial Intelligence.

UNIT I

(15 HOURS)

Introduction to Applied Artificial Intelligence

Review of Artificial Intelligence Concepts, AI in Everyday Life, Intelligent Systems, AI Applications in Business, Healthcare, Education, Finance, and E-Commerce.

AI Tools and Technologies

Virtual Assistants, Chatbots, Recommendation Systems, Search Engines, Image Recognition Systems, Speech Recognition Systems, AI-Based Productivity Tools.

AI in Business and Digital Marketing

Customer Segmentation, Personalization, Recommendation Engines, Marketing Automation, Customer Support Systems, AI for Business Intelligence.

UNIT II

(15 HOURS)

Generative AI and Content Creation

Introduction to Generative AI, Text Generation Tools, Image Generation Tools, AI-Assisted Content Creation, Applications in Marketing and Communication.

AI for Decision Making

Data-Driven Decision Making, Predictive Insights, Pattern Recognition Concepts, AI-Supported Business Decisions, Introduction to Intelligent Automation.

Ethics and Future of AI

Responsible AI, Bias in AI Systems, Privacy Issues, Ethical Use of AI, AI Governance, Future Trends and Opportunities in Artificial Intelligence.

Reference Books

1. Artificial Intelligence: A Modern Approach – Stuart Russell and Peter Norvig.
2. Artificial Intelligence Basics – Tom Taulli.
3. Artificial Intelligence for Business – Doug Rose.
4. Generative AI for Everyone – Andrew Ng.
5. AI for Marketing and Product Innovation – A.K. Pradeep, Andrew Appel and Stan Sthanunathan.

B.Sc. Digital Marketing and Artificial Intelligence(DM & AI)

Multiple Entry and Multiple Exit Option (NEP-2020)

PART I – SEMESTER II

Title of Course: Practical based on Subject III DSC III & Subject III DSC IV

Course Outcomes

After completion of this course students will be able to:

1. Identify computer hardware components and their functions.
2. Understand computer system configuration and maintenance procedures.
3. Install and manage operating systems using virtual machine environments.
4. Analyze process, memory, storage, and file management concepts.
5. Configure user accounts, permissions, and security settings.
6. Apply troubleshooting and system maintenance techniques in virtual environments.

Lab Work

Lab work is based on Computer Hardware and System Maintenance and Operating Systems Fundamentals. The practical course shall consist of exercises using Virtual Machine software and suitable system administration tools.

Part A: Computer Hardware and System Maintenance (10 Practicals)

Practical No.	Practical Title
1	Study of computer hardware components and motherboard architecture
2	Identification of CPU, RAM, Storage Devices, Expansion Cards and Peripheral Devices
3	Study of BIOS/UEFI settings and system configuration
4	Creation and configuration of a Virtual Machine
5	Installation of Windows Operating System on a Virtual Machine
6	Installation of Linux Operating System on a Virtual Machine
7	Study of system boot process and startup configuration
8	Disk partitioning and storage management in a virtual environment
9	System information analysis and hardware resource monitoring
10	Troubleshooting common hardware and system startup issues

Part B: Applied Artificial Intelligence (10 Practicals)

Practical No.	Practical Title
11	Study and exploration of AI-powered applications used in everyday life
12	Use AI chatbots and virtual assistants for information retrieval and task automation
13	Generate text content using Generative AI tools
14	Generate images using AI-based image generation tools
15	Analyze customer feedback or textual data using AI tools
16	Explore recommendation systems and personalized content platforms
17	Use AI tools for business productivity and decision-making support
18	Develop simple no-code AI models using Teachable Machine or equivalent tools
19	Create an AI-assisted digital marketing campaign using AI content generation tools
20	Mini Project: Design and document an AI-based solution for a business, marketing, or real-world application

B.Sc. Digital Marketing and Artificial Intelligence(DM & AI)

Multiple Entry and Multiple Exit Option

(NEP-2020)

PART I SEM II

Title of course: OE-II: Basics of HTML

Course Outcomes:

After completion of this course students will be able to;

1. Understand concepts of Tags in HTML.
2. Understand basics of CSS.
3. Design web pages using forms, iFrames, anchor tags, and structural elements like div and span.
4. Use various CSS types, selectors, and properties to style text, background, fonts, and layout.
5. Implement layout and positioning techniques using the CSS box model, float, and display properties.
6. Apply basic HTML tags to format text, create lists, tables, hyperlinks, and embed multimedia.

UNIT I

(15 HOURS)

HTML: Introduction to web programming, Introduction to HTML, History of HTML, Editors, Basic Formatting Tags,-Grouping Using Div Span, Lists, Working with Hyperlinks, Images and Multimedia, Tables, iFrame, Forms, Headers, Anchor tags & hrefs

UNIT II

(15 HOURS)

CSS: Introduction, Benefits of CSS, Types of CSS, Selectors, Color Background, Cursor, Text, Fonts, Span, opacity, List Tables, Box Model, Display Positioning, Floats, Dividing up content with the div tag, CSS borders

References:

1. Complete HTML- Thomas Powel HTML Black Book- Steven Holzner
2. Teach Yourself Web Technologies – Ivan Bayross
3. HTML and CSS 3- Seventh edition – Castro Elizabeth and Bruce Hyslop.

B.Sc. Digital Marketing and Artificial Intelligence (DM & AI)

Multiple Entry and Multiple Exit

Option (NEP-2020)

PART I SEM II

Title of course: VEC- I Democracy, Election and Constitution

Syllabus will be provided by Shivaji University as per NEP