



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 दुर्घटनी ०२३१-२६०९०९४



Ref./SU/BOS/Com & Mgt./ 261

Date : 03/05/2025

To,

The Principal

All Affiliated (Commerce & Management) Colleges/ Institutions,
Shivaji University, Kolhapur

**Subject :Regarding syllabi of B.C.A. Part-II (Sem. III & IV) degree programme
under the Faculty of Commerce & Management as per National Education
Policy, 2020 (NEP 2.0)**

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 syllabi of **B.C.A. Part-II (Sem. III & IV)** under the Faculty of Commerce & Management as per National Education Policy, 2020 **(NEP 2.0)**

This syllabi shall be implemented from the academic year **2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (Online Syllabus).

The question paper on the pre-revised syllabi of above mentioned course will be set for the examinations to be held in October/November 2025 & March/ April, 2026. These chances are available for repeater students, if any.

You are therefore, requested to bring this to the notice of all Students and Teachers concerned.

Thanking you,

Yours faithfully,

(Dr. S. M. Kubal)
Dy. Registrar

Encl: As above

for Information and necessary action

Copy to:

| | | | |
|---|--|----|---------------------------------|
| 1 | Dean, Faculty of Commerce & Management | 6 | Appointment Section A & B |
| 2 | Director, Board of Examinations and Evaluation | 7 | I.T. Cell /Computer Centre |
| 3 | Chairman, Respective Board of Studies | 8 | Eligibility Section |
| 4 | B. Com. Section | 9 | Affiliation Section (T.1) (T.2) |
| 5 | Internal Quality Assurance Cell (IQAC Cell) | 10 | P.G. Seminar Section |



Rayat Shikshan Sanstha's

SADGURU GADGE MAHARAJ COLLEGE, KARAD.

(An Empowered Autonomous College)

Accredited By NAAC with 'A⁺ (3.63 CGPA)' Grade ISO- 9001-2015

Certified

Affiliated to Shivaji University, Kolhapur

Faculty of Commerce and Management

Syllabus for Bachelor of Computer Applications (BCA) Part II (SEM-III & IV)

**CBCS Course Structure to be implemented from Academic Year 2025-26
(Under NEP 2.0)
as per AICTE Model Curriculum**

(Subject to the modifications that will be made from time to time)

BCA-II Sem-III

| Subject Code | Title of Theory Paper | Cre dits | TH / PR | CCE | | SEE | | Total Theory/Practical Marks |
|----------------|---|-----------|---------|-----------|------|------------|-----|------------------------------|
| | | | | Max. | Min. | Max | Min | |
| BCA24-CC301 | Probability and Statistics | 04 | TH | 20 | 8 | 80 | 32 | 100 |
| BCA24-CC302 | Data Base Management System | 02 | TH | 10 | 4 | 40 | 16 | 50 |
| BCA24-SEC303 | Python Programming | 02 | TH | 10 | 4 | 40 | 16 | 50 |
| BCA24-CC304 | Software Engineering | 03 | TH | 15 | 6 | 60 | 24 | 75 |
| BCA24-DSE305 | Professional Elective-I (Basics of Data Analytics using Spreadsheet) | 04 | TH | 20 | 8 | 80 | 32 | 100 |
| | Professional Elective-I (Feature Engineering) | | | | | | | |
| | Professional Elective-I (Web Programming) | | | | | | | |
| BCA24-VAC306 | Yoga/Sports/NCC/ NSS | 01 | TH/ PR | -- | -- | 25 | 10 | 25 |
| BCA24-CCP307 | Lab on DBMS | 02 | PR | -- | -- | 50 | 20 | 50 |
| BCA24-SECP308 | Lab on Python | 02 | PR | -- | -- | 50 | 20 | 50 |
| BCA24-DSEP309 | Lab on Elective-I | 02 | PR | -- | -- | 50 | 20 | 50 |
| Total:- | | 22 | | 95 | | 480 | | 550 |

Note: Professional Elective-I course (DSE201) should be kept from the same group as next consecutive semesters wherever applicable.

BCA-II Sem-IV

| Subject Code | Title of Theory Paper | Cre dits | TH / PR | CCE | | SEE | | Total Theory/Practical Marks |
|----------------|--|-----------|---------|-----------|------|------------|-----|------------------------------|
| | | | | Max. | Min. | Max | Min | |
| BCA24-CC401 | Computer Networks | 03 | TH | 15 | 6 | 60 | 24 | 75 |
| BCA24-CC402 | Design & Analysis of Algorithm | 03 | TH | 15 | 6 | 60 | 24 | 75 |
| BCA24-CC403 | Artificial Intelligence | 04 | TH | 20 | 8 | 80 | 32 | 100 |
| BCA24-DSE404 | Professional Elective-II(Data Visualization) | 04 | TH | 20 | 8 | 80 | 32 | 100 |
| | Professional Elective-II (Introduction to ML) | | | | | | | |
| | Professional Elective-II (Web Programming II) | | | | | | | |
| BCA24-SEC405 | Design Thinking & Innovation | 02 | TH | 20 | 8 | 30 | 12 | 50 |
| BCA24-CCP406 | Lab on RDBMS | 02 | PR | -- | -- | 50 | 20 | 50 |
| BCA24-CCP407 | Lab on AI | 02 | PR | -- | -- | 50 | 20 | 50 |
| BCA24-DSEP408 | Lab on Elective-II | 02 | PR | -- | -- | 50 | 20 | 50 |
| Total:- | | 22 | | 90 | | 460 | | 550 |

Note: Professional Elective-II course (DSE202) should be kept from the same group as per the Course selected under Professional Elective-I (DSE201.1/ DSE201.2/ DSE201.3) for this semester as well as next consecutive semesters wherever applicable.

SEMESTER-III

| | |
|----------------------|--|
| | <p>4. Miller Irwin and Miller Marylees, Mathematical Statistics with Applications, Seventh Edition, Pearson Education, 2005</p> <p>5. Pal Nabendu and Sarkar Sahadeb, Statistics: Concepts and Applications, Second Edition, PHI, 2013</p> <p>6. Montgomery Douglas and Runger George C., Applied Statistics and Probability for Engineers, Wiley, 2016.</p> <p>7. Reena Garg, Engineering Mathematics, Khanna Publishing House, 2024.</p> |
| Web Resources | <p>https://nptel.ac.in/courses/111106112</p> <p>https://nptel.ac.in/courses/111105041</p> |

BCA24-CCP307: Database Management Systems Practical List

1. Draw an ER Diagram of Sales system.
2. Draw an ER Diagram of Hospital Management System.
3. Convert The ER diagram in question no 1 into tables.
4. Convert the ER diagram of question no 2 into tables.
5. Consider the following Schema
Supplier(SID, Sname, branch, city, phone)
Part (PID, Pname, color, price)
Supplies(SID, PID, qty, date_supplied)
 - a. Create above tables in ACCESS for data entry.
 - b. Create relationships between these tables in ACCESS.
 - c. Perform SQL Queries including joins
 - d. Create a form for these tables and perform data entry.
 - e. Create a report in Access
6. Demonstrate how to create a blank form in Access.
7. Demonstrate how to split form in Access.
8. Demonstrate how to create a form that displays multiple records in Access.
9. Demonstrate how to create a form that contains a subform in Access.
10. Demonstrate how to create a Navigation form in Access.
11. Demonstrate how to create reports in Access.
12. Demonstrate how to create reports in Access with grouping, sorting or totals.
13. Demonstrate how to highlight data with conditional formatting.

BCA24-SECP308:Python Programming Lab

1. Write a program to find whether a number is a prime number.
2. Write a program to print m raise to power n, where m and n are read from the user.
3. Write a program having a parameterized function that returns True or False depending on whether the parameter passed is even or odd.
4. Write a program to print the summation of the following series upto n terms:1-2+3-4+5-6+7 ----- n
5. Write a menu driven program to perform the following operations on strings using stringbuilt in functions.
 - a. Find the frequency of a character in a string.
 - b. Replace a character by another character in a string.
 - c. Remove the first occurrence of a character from a string.
 - d. Remove all occurrences of a character from a string.
6. Write a program that accepts two strings and returns the indices of all the occurrences of thesecond string in the first string as a list. If the second string is not present in the first string,then it should return -1
7. Using Numpy module write menu driven program to do following
 - a. Create an array filled with 1's.
 - b. Find maximum and minimum values from an array
 - c. Dot product of 2 arrays.
 - d. Reshape a 1-D array to 2-D array.
8. Write a function that takes a sentence as input from the user and calculates the frequency of each letter. Use a variable of dictionary type to maintain the count.
9. Consider a tuple t1=(1,2,5,7,9,2,4,6,8,10). Write a program to perform following operations:
 - a. Print contents of t1 in 2 separate lines such that half values come on one line and otherhalf in the next line.
 - b. Print all even values of t1 as another tuple t2.
 - c. Concatenate a tuple t2=(11,13,15) witht1.
 - d. Return maximum and minimum value from t1.
10. Write a function that reads a file file1 and copies only alternative lines to another file file2. Alternative lines copied should be the odd numbered lines.
11. Write a Python program to handle a ZeroDivisionError exception when dividing a number by zero.
12. Write a program that reads a list of integers from the user and throws an exception if any numbers are duplicates.
13. Write a program that makes use of a function to display sine, cosine, polynomial and exponential curves.
14. Take as input in the months and profits made by a company ABC over a year.
Represent this data using a line plot.
Generated line plot must include X axis label name = Month Number and Y axis label Name = Total profit.

| Course Code | Cours Title | L | T | P | Credit | Theory | | | Practical | | | | | |
|-------------------------------|--|---|---|---|--------|--------|-----|-------|-----------|-----|--|--|--|--|
| DSE201.1 | Professional Elective – I Basics of Data Analytics using Spreadsheet | 4 | 0 | 4 | 6 | Int | Uni | Total | Int | Uni | | | | |
| | | | | | | 20 | 80 | 100 | 50 | -- | | | | |
| <i>Course Outcomes (COs):</i> | CO1: Understand the basics of MS Excel for data analytics and its applications. CO2: To explore advanced Excel functions and data analytics tools. CO3: Develop proficiency in using spreadsheet software for data manipulation and Analysis. CO4: Build and use spreadsheet models for decision making & Communicate data insights effectively | | | | | | | | | | | | | |
| Prerequisite | Knowledge on basics of mathematical & Statistical concepts such as arithmetic, Percentages, averages, and basic algebra. | | | | | | | | | Hrs | | | | |
| UNIT I | Introduction to MS-Excel Spreadsheets basics, Need for Spreadsheets, Work-Book, Work –Sheet, Parts of aMS-Excel Work-Sheet- Program area, Work area, Contents of Title-Bar, Manu-Bar,Contents of Manu Ribbons, Meaning of Cell- Cell address, Formula-Bar, Row-Numbers, Column-Letters, Quick Access to Tool-Bar, Office Button, FloatingFrames, Adding Work-Sheets in Sheet Tab, Status- Bar., and other features of Excel. | | | | | | | | | | | | | |
| UNIT II | Advanced Excel Functions: VLOOKUP, HLOOKUP, INDEX-MATCH, and PivotTables. Data Analysis ToolPak: UsingExcel's built-in data analysis tools such as Descriptive Statistics, Histograms, Correlation, and Regression. | | | | | | | | | | | | | |
| UNIT III | Introduction to Data Analytics Understanding data and its types (structured, unstructured, semi-structured)-What is Data Analytics- Types of data Analytics-Importance of Data Analytics- Applications of Data Analytics. | | | | | | | | | | | | | |
| UNIT IV | Case Studies on Data Analytics: Data Collection Methods - Different Data Sources & format - Data Cleaning and Transformation - Handling Missing Data and Outliers. - Ethical considerations in data analytics. - Real-world Applications of Data Analytics- Industry-specific applications (finance, marketing, operations) - Case Study Note: Case study is for discussion not to be considered for evaluation. | | | | | | | | | | | | | |
| TextBooks/ Reference Books | 1. "Beginner's Guide for Data Analysis using R Programming" by Jeeva Jose, Khanna Publishing House, 2024. 2. "Data Analytics" by V.K. Jain, Khanna Book Publishing Company, 2024. 3. "Excel Data Analysis For Dummies" by Stephen L. Nelson and E. C. Nelson, John Wiley & Sons; 3rd edition, 2016 4. "Data Analysis Using Microsoft Excel" by Michael R. Middleton, Thomson, Brooks/Cole, 3rd edition, 2004 5. "Excel 2019 Bible" by Michael Alexander, Richard Kusleika, and John Walkenbach, John Wiley & Sons, 25 Sept 2018 6. "Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics" by Cliff T Ragsdale, Cengage learning asia pet. 2015 7. "Mastering Excel" by WebTech Solutions, Khanna Publishing House, 2024. | | | | | | | | | | | | | |

DSE201.1: Professional Elective – I Basics of Data Analytics using Spreadsheet Program List

PART – A: Understanding and Describing the Data

Introduction to Excel and Basic Functions

1. Getting started with Excel: Workbook, Worksheet, Cells, and Ranges
2. Data entry and basic formatting techniques
3. Using basic arithmetic functions: SUM, AVERAGE, MIN, MAX, ROUND
4. Introduction to cell referencing: relative, absolute, and mixed

Data Importing and Pre-processing

1. Importing data from various sources (CSV, text files, web data)
2. Data cleaning: removing duplicates, handling missing data, and standardizing formats
3. Data transformation: text-to-columns, data validation techniques
4. Using the "Find & Replace" and "Text Functions" (LEFT, RIGHT, MID, CONCATENATE)

Descriptive Statistics Using Excel

1. Calculating measures of central tendency: mean, median, mode
2. Computing measures of dispersion: range, variance, standard deviation
3. Creating and interpreting frequency distributions and histograms
4. Using Excel's "Data Analysis Toolpak" for basic statistical analysis

PART- B: Beyond the Basics: Visualizing and Communicating Data

Advanced Spreadsheet Functions

1. Using logical functions: IF, AND, OR, IFERROR
2. Lookup and reference functions: VLOOKUP, HLOOKUP, INDEX, MATCH
3. Data aggregation techniques: SUMIFS, COUNTIFS, AVERAGEIFS
4. Text functions for data manipulation: TRIM, CLEAN, TEXT, RIGHT, LEFT, MID

Data Visualization Techniques

1. Creating various chart types: bar, line, pie, scatter
2. Advanced charting techniques: combo charts, dual-axis charts
3. Data visualization best practices: choosing the right chart, formatting, and styling
4. Creating and customizing PivotTables and Pivot Charts

Dashboard Creation

1. Introduction to dashboards: concepts and components
2. Using PivotTables and Pivot Charts for dashboard elements
3. Applying conditional formatting for dynamic visual cues
4. Creating interactive dashboards with slicers and timeline

DSE201.2 FeatureEngineering Laboratory

1. Fillmissing values in the "Age" column using the mean/median/mode value in a dataset with columns "Age", "Height", "Weight", and "Grade".
2. Clean a data set having columns 'Name', 'Gender' and 'Age' where the "Name" column contains an entry like "invalid data".
3. Apply Min-Max normalization having columns "Height" and "Weight" in a dataset.
4. Visualize the distribution of "Age" in a dataset using a histogram.
5. Compute and visualize the correlation matrix for "Height" and "Weight" in a dataset.
6. Bin "Age" into categories such as "Young" (0-18), "Adult" (19-40), "Middle-Aged" (41-60), and "Senior" (60+).
7. Create polynomial features from two numerical columns "Height" and "Weight".
8. Apply a logarithmic transformation to the "Distance" column in a dataset.
9. Apply one-hot encoding to the "Category" column containing values ["Good", "Better", "Best"] and the "Gender" column with ["Male", "Female"].
10. Tokenize the text data for a dataset with a column 'Text'.
11. Apply stemming to the text for a dataset with a column 'Text'.
12. Apply lemmatization for a dataset with a column 'Text'.
13. Convert text data into a Bag-of-Word representation for a dataset with a column 'Text'.
14. Apply TF-IDF transformation to text data for a column 'Text'.
15. Resize an image in a dataset to 256x256 pixels.
16. Rotate image in a dataset by 30 degrees and translate by 10 pixels.
17. Decompose a time series into trend, seasonal, and residual components for a dataset with a column 'TimeSeries'.
18. Perform Principal Component Analysis (PCA) on a dataset and visualize the first two principal components.

BCA24-DSEP309 Professional Elective– I Advance Web Technology Laboratory

1. Create a simple Web Page with HTML5 & CSS3
2. Write a program to set Headers , Paragraph for web page
3. Write a program to set pages for webpage
4. Write a program to create animation elements
5. Write a program to create a responsive website for all devices
6. Write a program to create Box and set Positions for elements
7. Write a program to create buttons and use for pages or send forms
8. Write a program to insert Video and Audio in webpage
9. Write a program to create attractive Form using different form elements
10. Write a program to create Circle, Thumbnail and set Text on images
11. Write a JQuery program to demonstrate different selectors.
12. Write a JQuery program to demonstrate different events.
13. Write a JQuery program to set and get HTML contents and attributes.
14. Write a JQuery program to set and return CSS properties.

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| | <ul style="list-style-type: none"> • Obesity - Concept, Causes, Obesity Related Health Problems • Weight Management through Behavioural Modifications | |
| TextBooks/ Reference Books | <ul style="list-style-type: none"> • Anand O P. Yog Dawra Kaya Kalp. Sewasth Sahitya Perkashan. Kanpur. • Brown, J.E. Nutrition Now Thomson-Wadsworth. • Corbin et.al.Fitness & Wellness-Concepts. McGraw Hill. Publishers. New York.U.S.A • Corbin, C. B., G. J. Welk, W. R Corbin, K. A. Welk, Concepts of Physical Fitness: Active Lifestyle for Wellness. McGraw Hill, New York, USA. • Hoeger, W W K and S.A. Hoeger. Principles and Labs for Fitness and Wellness, Thomson Wadsworth, California, USA. • Hoeger, W.W. & S. Hoeger Fitness and Wellness. 7th Ed. Thomson Wadsworth, Boston, USA. • Kamlesh, M. L. & Singh, M. K.) Physical Education (Naveen Publications). • Kansal, D.K. Text book of Applied Measurement, Evaluation & Sports Selection. Sports & Spiritual Science Publications, New Delhi. • Kumari, Sheela, S., Rana, Amita, and Kaushik, Seema,, Fitness, Aerobics and Gym Operations, Khel Sahitya, New Delhi • Lumpkin, A. Introduction to Physical Education, Exercise Science and Sports Studies, McGraw Hill, New York, U.S.A. • Sarin N) Yoga Dawara Rogon Ka Upchhar.Khel Sahitya Kendra • Savard, M. and C. Svec The Body Shape Solution to Weight Loss and Wellness: The Apples & Pears Approach to Losing Weight, Living Longer, and Feeling Healthier. Atria Books, Sydney, Australia. • Siedentop, D. Introduction to Physical Education, Fitness and Sport, McGraw Hill Companies Inc., New York, USA. • Sri Swami Ramas. Breathing. Sadhana Mandir Trust.Rishikesh. • Swami Ram Yoga & Married Life Sadhana Mandir Trust. Rishikesh | |

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|----------------------------------|--|--|
| | <ul style="list-style-type: none"> • Key performance indicators (KPIs) in sports • Applications of analytics: talent scouting, injury prevention, performance optimization. | |
| TextBooks/ Reference Books | <ol style="list-style-type: none"> Pedersen, P. M., Thibault, L., & Pedersen, P. M. (2019). <i>Contemporary Sport Management</i>. Human Kinetics. Hoye, R., Smith, A. C. T., Nicholson, M., et al. (2021). <i>Sports Management: Principles and Applications</i>. Routledge. Chelladurai, P., & Kerwin, S. (2017). <i>Introduction to Sport Management: Theory and Practice</i>. Human Kinetics. Hoye, R., Cuskelly, G., & Nicholson, M. (2019). <i>Sports Governance: A Guide for Sport Organizations</i>. Routledge. Conrad, M. (2018). <i>The Business of Sports: A Primer for Journalists</i>. Routledge. Shank, M. D. (2019). <i>Sports Marketing: A Strategic Perspective</i>. Pearson. Collett, P., & Fenton, W. (2019). <i>The Sponsorship Handbook: Essential Tools, Tips and Techniques for Sponsors and Sponsorship Seekers</i>. Kogan Page. Fullerton, S. Jr., & Funk, D. C. (2019). <i>Sports Marketing: A Practical Approach</i>. Routledge. Conrad, M. (2019). <i>Winning in Sports Business: Essential Marketing, Finance, and Management Strategies</i>. Routledge. McCarty, L. A., & McPherson, G. (2019). <i>Sports Event Management: The Caribbean Experience</i>. Routledge. Brown, M. T., Rascher, D., & Leeds, M. A. (2017). <i>Financial Management in the Sport Industry</i>. Routledge. Winfree, J. A., & Rosentraub, M. S. (2017). <i>Sports Finance and Management: Real Estate, Entertainment, and the Remaking of the Business</i>. Taylor & Francis. Foster, G., O'Reilly, N., & Cuskelly, G. (2018). <i>Sports Business Management: Decision Making Around the Globe</i>. Routledge. Brown, M. T., & Shick, D. M. (2019). <i>Financial Management in the Sport Industry</i>. Routledge. Conrad, M. (2018). <i>The Business of Sports: A Primer for Journalists</i>. Routledge. Alamar, B. C. (2013). <i>Sports Analytics: A Guide for Coaches, Managers, and Other Decision Makers</i>. Columbia University Press. Miller, T. W. (2019). <i>Sports Analytics and Data Science: Winning the Game with Methods and Models</i>. FT Press. Marchi, M., Albert, J., & Baumer, B. (2014). <i>Analyzing Baseball Data with R</i>. Chapman and Hall/CRC. Schumaker, R. P., Hwang, R. S. Y., & Chen, H. (2016). <i>Sports Data Mining</i>. Routledge. Alamar, B. C. (2013). <i>Sports Analytics: A Guide for Coaches, Managers, and Other Decision Makers</i>. Columbia University Press. | |

of Indian Youth. *Journal of Social Sciences*, 6(3), 209-214.

7. Mills, S. (2013). "An instruction in good citizenship": scouting and the historical geographies of citizenship education. *Transactions of the Institute of British Geographers*, 38(1), 120–134. <http://www.jstor.org/stable/24582445>

8. Mishra, S. K., Sachdev, S., Marwaha, N., & Avasthi, A. (2016). Study of knowledge and attitude among college-going students toward voluntary blood donation from north India. *Journal of blood medicine*, 19-26.

9. Mukherji, B. (2007). Community Development in India. Orient Longmans.

10. History Background of NSS and its Philosophy, Aims and Objectives

11. <https://www.osmania.ac.in/NSS%20URL/9.%20%20Historical%20Background%20of%20NSS%20and%20its%20Philosophy,%20Aim.pdf>

12. In Defence of Nationalism <https://www.mkgandhi.org/indiadreams/chap03.htm>

13. Unlocking Youth Potential for Nation Building: Strengthening NYKS and NSS

14. <https://www.undp.org/india/projects/strenghtening-nyks-and-nss>

| | |
|---------------|--|
| | 9. Govt. of India (2011) Disaster Management in India. Ministry of Home Affairs, New Delhi. 10. Matthews, J.A., (2002) Natural Hazards and Environmental Change, Bill McGuire, Ian Mason. |
| Web Resources | http://www.ndma.gov.in/en/ http://nidm.gov.in/ https://www.unisdr.org/ http://www.emdat.be https://www.weather.gov/safety/ https://www.preventionweb.net/risk/vulnerability |

BCA-II SEMESTER –IV

BCA24-CCP406: Relational Database Management System(RDBMS) Lab

DDL Commands

Consider the following Schema Supplier(SID, Sname, branch, city, phone) Part(PID, Pname, color, price) Supplies(SID, PID, qty, date_supplied)

Create the above tables

Add a new attribute state in supplier table

Remove attribute city from supplier table

Modify the data type of phone attribute

Change the name of attribute city to address

Change a table's name, supplier to sup

Use truncate to delete the contents of supplies table

Remove the part table from database

DML Commands

1. Insert at least 10 records in tables supplier, part and supplies

2. Show the contents in tables supplier, part and supplies

3. Find the name and city of all suppliers

4. Find the name and phoneno of all suppliers who stay in 'Delhi'

5. Find all distinct branches of suppliers

6. Delete the record of the supplier whose SID is 204001

7. Delete all records of supplier table

8. Delete all records of suppliers whose city starts with capital A.

9. Find the supplier names which have 'lk' in any position

10. Find the supplier name where 'R' is in the second position

11. Find the name of supplier whose name starts with 'V' and ends with 'A'

12. Change the city of all suppliers to 'BOMBAY'

13. Change the city of supplier 'Vandana' to 'Goa'

Queries with Constraints

1. Create the supplier table with Primary Key Constraint

2. Create supplies table with Foreign key Constraint

3. Create a part table with UNIQUE Constraint

4. Create supplier Table with Check Constraints

5. Create Supplier table with Default Constraint

Queries on TCL

1. Create Savepoints

2. Rollback to SavePoints

3. Use Commit to save on Aggregate Functions:

4. Find the minimum, maximum, average and sum of costs of parts

5. Count the total number of parts present

6. Retrieve the average cost of all parts supplied by 'Mike' Queries on GROUP BY,

HAVING AND ORDER BY Clauses

1. Display total price of parts of each color

2. Find the branch and the number of suppliers in that branch for branches which have more then 2

suppliers

3. Find all parts sorted by pname in ascending order and cost in descending order
4. Find the branch and the number of suppliers in that branch

Queries on Operators

1. Find the pname, phoneno and cost of parts which have cost equal to or greater than 200 and less than or equal to 600.
2. Find the sname , SID and branch of suppliers who are in 'local' branch or 'global' branch
3. Find the pname, phoneno and cost of parts for which cost is between 200 and 600
4. Find the pname and color of parts, which has the word 'NET' anywhere in its pname.
5. Find the PID and pname of parts with pname either 'NUT' or 'BOLT'
6. List the suppliers who supplied parts on '1st may2000', '12 JAN 2021', '17 dec 2000', '10 Jan 2021'
7. Find all the distinct costs of parts

Join Operators

1. Perform Inner join on two tables
2. Perform Natural Join on two tables
3. Perform Left Outer Join on tables
4. Perform Right Outer join on tables
5. Perform Full Outer Join on tables
6. Show the use of UNION operator with union compatibility
7. Show the use of intersect operator with union compatibility
8. Show the use of minus operator with union compatibility
9. Find the Cartesian product of two tables

Demonstration on PL/SQL block, cursor, trigger, functions and stored procedure.

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|-------------------------------|--|--|
| | <p>Network FunctionVirtualization (NFV), Internet of Things (IoT) and Its Impact on Networking</p> <p>Network Management: SNMP, Simple Network Management Protocol, Network Monitoring, Tools and Techniques.Future Trends in Networking: 5G and Beyond, Network Automation and ArtificialIntelligence in Networking.</p> | |
| TextBooks/ Reference Books | <ol style="list-style-type: none"> 1. Andrew S. Tanenbaum, "Computer Networks", 5th Edition, Pearson Education, 2011. 2. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach", 8thEdition, Pearson, 2021. 3. Behrouz A. Forouzan, "Data Communications and Networking", 5th Edition, McGraw-HillEducation, 2012. 4. Larry L. Peterson and Bruce S. Davie, "Computer Networks: A Systems Approach", 6thEdition, Morgan Kaufmann, 2019. 5. Bhavneet Sidhu, An Integrated Approach to Computer Networks, Khanna PublishingHouse, 2023. 6. Mastering PC Hardware & Networking, Khanna Publishing House, 2024. | |
| Web Resources | <ol style="list-style-type: none"> 1. Cisco Networking Academy - Online Courses and Resources 2. NetworkLessons.com - Tutorials on Various Networking Topics | |

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| | <p>6. Russell, S. and Norvig, P., “Artificial Intelligence - A Modern Approach”, 3rd edition, Prentice Hall</p> <p>7. Van Hirtum, A. & Kolski, C. (2020). Constraint Satisfaction Problems: Algorithms and Applications. Springer</p> <p>8. Rajiv Chopra, Machine Learning and Machine Intelligence, Khanna Book Publishing Company, 2024.</p> |
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BCA24-CCP407: Artificial Intelligence LAB Experiments

1. Demonstrate basic problem-solving using Breadth-First Search on a simple grid.
2. Implement Depth-First Search (DFS) on a small graph.
3. Solve the Water Jug Problem using Breadth First Search (BFS).
4. Implement a Hill Climbing search to find the peak in a numeric dataset.
5. Apply the A* Search algorithm to find the shortest path in a 4x4 grid.
6. Implement the Minimax search algorithm for 2-player games. You may use a game tree with 3 plies.
7. Solve the 4 – Queens Problem as a CSP backtracking problem.
8. Use constraint propagation to solve a Magic Square puzzle.
9. Apply optimization techniques to find the maximum value in a list.
10. Represent and evaluate propositional logic expressions.
11. Implement a basic rule-based expert system for weather classification.

DSE202.1 Professional Elective – II Data Visualization Program List

Introduction to Power BI Interface and Basics

1. Installation and interface overview
2. Exploring the Power BI workspace: Ribbon, panes, and canvas.
3. Importing data from Excel and CSV files.
4. Introduction to multiple data sources
5. Basic report creation: Adding visuals and saving a report.

Data Transformation and Preparation

1. Using Power Query Editor
2. Cleaning data: Removing duplicates, handling missing values.
3. Transforming data: Splitting columns, changing data types, renaming columns.
4. Merging and appending queries.
5. Creating custom columns and calculated columns

Data Modeling

1. Creating relationships between tables
2. Identifying and resolving data inconsistencies
3. Creating calculated columns and measures

Creating Basic Visualizations

1. Creating various chart types (bar, column, line, pie, area, etc.,)
2. Formatting and customizing visualizations Publishing and Sharing Reports
3. Publishing a report to Power BI Service.
4. Sharing reports and dashboards with team members.
5. Setting up data refresh schedules and managing permissions.

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| | Algorithms (Naive Bayes, K-Nearest Neighbors, Decision Trees) Clustering Algorithms(K-Means,Hierarchical Clustering, DBSCAN,Clustering Validation Measures) | |
| UNIT III | MLModels and Performance Evaluation Parameters Training,Validation and Testing ofMLModels Performance Evaluation Parameters(Confusion Matrix, Accuracy, Precision, Recall, F1 Score, AUC) | 15 |
| UNIT IV | Neural Networks Introduction to Neural Networks Ethical Considerations in MachineLearning CaseStudy and Real-WorldApplications | 15 |
| TextBooks/ Reference Books | 1. SenseofData.CambridgeUniversityPress.ISBN:9781107422223, 2012. 2. Duda, R. O.,Hart,P.E., Stork,D(2007).Patternclassification(2Ed),JohnWiley& Sons, ISBN-13: 978-8126511167. 3. HaykinS.(2009).NeuralNetworksandLearningMachines,ThirdEdition,PHI Learning. 4. Chollet,F. (2018).DeepLearningwithPython. Manning Publications. 5. Bishop,C.M.(2006).PatternRecognitionandMachineLearning. Springer. 6. Goodfellow,I., Bengio, Y.,&Courville, A. (2016).DeepLearning. MIT Press. 7. Géron,A.(2017).Hands-OnMachineLearningwithScikit-Learnand TensorFlow: 8. Concepts,Tools, andTechniques toBuildIntelligentSystems*(1sted.).O'Reilly Media | |
| Web Resources | 1. https://www.coursera.org/learn/machine-learning 2. https://www.udacity.com/course/aws-machine-learning | |

DSE202.2 Introduction to ML Laboratory

1. Use the any numerical dataset with one dependent variable and one independent variable and implement a linear regression model. Visualize the data points and plot the regression line.
2. Choose any binary classification dataset (useonlytwoclasses). Implement logistic regression. Plot the decision boundary between the two classes.
3. Choose any classification dataset. Implement a decision tree classifier and Visualize the decision tree
4. Implement Naïve Bayes classifier on any text classification dataset.
5. Implement a random forest classifier using a numerical dataset.
6. Implement a support vectormachine for linearly separable classes and visualize decision boundary along with the margins
7. Implement K-Means clustering on a point dataset and visualize and evaluate the clusters.
8. Implement hierarchical clustering on a dataset and plot the dendrogram.
9. Implement DBSCAN clustering on a dataset and visualize and evaluate the clusters.
10. Use the Iris Dataset or another numerical dataset. Implement PCAtoreducethe dimensionalityof the dataset. ApplyanyclassifierbeforeandafterPCA. Evaluate and compare performance emetrics (e.g., accuracy) before and after PCA
11. Build asingle layer perceptronmodelto classifyAND, OR, and XOR problems(mayuse Tens or Flow/Keras) and visualize their decision boundaries. Also evaluate its performance.
12. Demonstrate the concept of boosting using the AdaBoost algorithm

BCA24-DSEP408 Web Programming II Laboratory

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. Write a PHP script to sort an array.
8. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
9. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
10. Create a script to construct the following pattern, using nested for loop.
* *
* * *
* * * *

11. Write a PHP class 'Rectangle' that has properties for length and width. Implement methods to calculate the rectangle's area and perimeter.
12. Write a PHP class called 'Shape' with an abstract method 'calculateArea()'. Create two subclasses, 'Triangle' and 'Rectangle', that implement the 'calculateArea()' method.
13. Write a PHP interface called 'Resizable' with a method 'resize()'. Implement the 'Resizable' interface in a class called 'Square' and add functionality to resize the square.
14. Write a PHP a class hierarchy for a library system, including classes like 'LibraryItem', 'Book', 'DVD', etc. Implement appropriate properties and methods for each class.
15. Write a PHP abstract class called 'Animal' with abstract methods like 'eat()' and 'makeSound()'. Create subclasses like 'Dog', 'Cat', and 'Bird' that implement these methods.
16. Write a class called 'Employee' that extends the 'Person' class and adds properties like 'salary' and 'position'. Implement methods to display employee details.
17. Write a class called 'Math' with static methods like 'add()', 'subtract()', and 'multiply()'. Use these methods to perform mathematical calculations.
18. Write a PHP class called 'Calculator' that has a private property called 'result'. Implement methods to perform basic arithmetic operations like addition and subtraction.
19. Write a PHP class called 'ShoppingCart' with properties like 'items' and 'total'. Implement methods to add items to the cart and calculate the total cost.
20. Write a class called 'Validation' with static methods to validate email addresses, passwords, and other common input fields.
21. Write a PHP program that demonstrates the basic usage of try-catch blocks to handle exceptions.
22. Write a PHP program that implements a PHP function that divides two numbers but throws an exception if the denominator is zero.
23. Write a PHP script that uses try-catch blocks to handle different types of exceptions and display appropriate error messages.
24. Write a PHP program that reads data from a file and throws a custom exception if the file does not exist.

