હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી

NAAC B (2.21) State University

પો.બો.નં.–૨૧, યુનિવર્સિટી રોડ, પાટણ (ઉ.ગુ.) ૩૮૪૨૬૫

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પરિપત્ર નં.- ૮૯ /૨૦૨૪ *રાષ્ટ્રીય શિક્ષણ નીતિ-૨૦૨૦*

વિષયઃ મેનેજમેન્ટ વિદ્યાશાખા હેઠળના સ્નાતક કક્ષાના સેમેસ્ટર-૩ અને ૪ના શૈ. વર્ષઃ ૨૦૨૪-૨૫ થી ક્રમશઃ અમલમાં આવતા અભ્યાસક્રમ / પરિક્ષા સ્કીમ અંગે.

આ યુનિવર્સિટીની મેનેજમેન્ટ વિદ્યાશાખા હેઠળની તમામ કોલેજોના આચાર્યશ્રીઓને જણાવવાનું કે, મેનેજમેન્ટ વિદ્યાશાખાની તારીખઃ ૨૬/૦૩/૨૦૨૪ના રોજ મળેલ સભાના નિર્દિષ્ટ ઠરાવોથી રાષ્ટ્રીય શિક્ષણ નીતિ-૨૦૨૦ અંતર્ગત UGCની Guideline મુજબ મેનેજમેન્ટ વિદ્યાશાખા હેઠળના નીચેના સ્નાતક કક્ષાના સામેલ પરિશિષ્ટ પ્રમાણેના નવા અભ્યાસક્રમો મંજુર કરવા કરેલ ભલામણ માન. કુલપતિશ્રીએ એકેડેમિક કાઉન્સિલવતી સ્વીકારી શૈક્ષણિક વર્ષઃ ૨૦૨૪-૨૫થી ક્રમશઃ અમલમાં આવે તે રીતે મંજુર કરેલ છે, જેનો અમલ કરવા સારૂ સબંધિતોને આ સાથે મોકલવામાં આવે છે.

ક્રમ	અભ્યાસક્રમ	ઠરાવ ક્રમાંક	સેમેસ્ટર
૧	કોમ્પ્યુટર સાયન્સ	૨	સેમેસ્ટર ૩ અને ૪
૨	બિઝનેશ એડમિનિસ્ટ્રેશન	૩	સેમેસ્ટર ૩ અને ૪

સદર બાબતની જાણ આપના સ્તરે થી અધ્યાપકશ્રીઓ તથા વિદ્યાર્થીઓને કરવા વિનંતી છે.

નોંધઃ (૧) વિદ્યાર્થીઓની જરૂરીયાત માટે પરીપત્રની એક નકલ કોલેજના / ડિપાર્ટમેન્ટના ગ્રંથાલયમાં મૂકવાની રહેશે.

(૨) આ પરીપત્ર યુનિવર્સિટીની વેબસાઇટ www.ngu.ac.in પર પણ ઉપલબ્ધ કરવામાં આવેલ છે. આથી સંબિધત કોલેજોને ડાઉનલોડ કરી ઉપયોગ કરવા સારૂ જણાવવામાં આવે છે.

કા. કુલસચિવ

બિડાણઃ ઉપર મુજબ

નં-એકે/અ×સ/૭૦૦ /૨૦૨૪

તારીખઃ૧૬/ ૦૫ /૨૦૨૪

પ્રતિ,

૧. ડીનશ્રી, મેનેજમેન્ટ સ્ટડીઝ વિદ્યાશાખા તરફ.
૨. મેનેજમેન્ટ સ્ટડીઝ વિદ્યાશાખા હેઠળની કોલેજોના આચાર્યશ્રીઓ તરફ
૩. પરીક્ષા નિયામકશ્રી, હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી પાટણ.
૪. ગ્રંથપાલશ્રી, હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી પાટણ.(વિદ્યાર્થીઓના ઉપયોગ સારૂ રેકર્ડ ફાઇલ અર્થે)
૫. માન.કુલપતિશ્રી/કુલસચિવશ્રીનું કાર્યાલય હેમચંદ્રાચાર્ય ઉત્તર ગુજરાત યુનિવર્સિટી પાટણ.
૬. સિસ્ટમ એનાલીસ્ટશ્રી, કોમ્પ્યુટર (રીઝલ્ટ સેન્ટર) હેમ.ઉ.ગુ.યુનિવર્સિટી, પાટણ.(વેબસાઇટ પર મુકવા સારૂ)
૭. પ્રવેશ પ્ર-શાખા, હેમ.ઉ.ગુ.યુનિવર્સિટી, પાટણ
૮. મહેકમ શાખા, હેમ.ઉ.ગુ.યુનિવર્સિટી, પાટણ.(૨ નકલ)

NATIONAL EDUCATION POLICY - 2020 (NEP-2020)

w. e. f. June 2024

Model Curriculum Structure for

Bachelor of Computer Applications (BCA) Programme (Semester 3 and 4)

Submitted to

Hemchandracharya North Gujarat University, Patan.

Preface

Greetings from NEP 2020 Computer Science Syllabus Framing Committee!

We extend our heartfelt gratitude to the university for initiating the implementation of NEP-2020. It is an honor for us to be part of the process through the Board of Studies for Computer Science.

Our committee, tasked with framing the syllabus for semester 3 and 4 for BCA Programme, has diligently conducted various offline and online meetings to discuss and finalize the curriculum. These deliberations have not only shaped the syllabus for BCA but also defined the Programme and Course outcomes. A model draft curriculum structure for BCA Program's 3rd and 4th semesters was presented virtually during the committee meeting on 5th December 2023. The valuable inputs received during this session are being carefully considered for further revisions.

We are fully committed to completing the remaining portion of the BCA Program syllabus and will continue to work diligently to meet all academic requirements for the successful implementation of the curriculum in alignment with the principles of NEP-2020.

Sincerely,

Dr. Namrata Gupta
(namratag_gupta@yahoo.com)
Chairperson, Board of Studies in Computer Science, HNGU, Patan.
Principal,
Smt. B. K. Mehta I.T. Center (B.C.A.) College,
Palanpur.

Member of Board of Studies (Computer Science)

S. No.	Member's Name	Designation
1	**Dr. Namrata Gupta** Principal, Smt. B. K. Mehta I.T. Center (B.C.A.) College, Palanpur.	Chairperson
2	**Dr. Jaydeep Trivedi** Principal, Matrushri L.J.Gandhi B.C.A College, Modasa.	Member
3	**Mr. Natvar Patel** Asst. Professor, Smt. B. K. Mehta I.T. Center (B.C.A.) College, Palanpur.	Member
4	**Mr. Jayram Suthar** Asst. Professr, Shree R. K. Patel BCA College, Nani Kadi.	Member
5	**Dr. Bhavesh Patel** I/C Head , Department of Computer Science, Hemchandracharya North Gujarat University, Patan.	Member
6	**Mr. Nirav Thakkar** Asst. Professor, Shri Sarvajanik BCA And PGDCA College, Mehsana.	Member (Invitee)

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

"Accredited By NAAC with 'A' Grade (CGPA 3.02)"

Bachelor of Computer Application (BCA)

w. e. f. June 2024 under NEP 2020

SEMESTER - III

COURSE TYPE	COURSE CODE	COURSE TITLE	CREDIT	WORK HOUR/WEEK		EXAM HOUR	TOTAL MARKS	
				TH	PR		TH	PR
Discipline Specific Course (MAJOR)	MS23MJDSCBCA301	Data Structure	4	4	-	2	100	-
Discipline Specific Course (MAJOR)	MS23MJDSCBCA301A	Relational Database Management System	4	4	-	2	100	-
Discipline Specific Course (MAJOR)	MS23PMJDSCBCA301B	**PRACTICAL –** DATA STRUCTURE	2	-	4	2	-	50
Discipline Specific Course (MAJOR)	MS23PMJDSCBCA301C	**PRACTICAL –** RDBMS	2	-	4	2	-	50
Multi-Disciplinary Course	MS23MDCBCA303	Computer Network	4	4	-	2	100	-
Ability Enhancement Course	MS23AECBCA304	Environmental Science	2	2	-	1	50	-
Indian Knowledge System	MS23IKSBCA305	Health Education	2	2	-	1	50	-
Skill Enhancement Course	MS23SECBCA306	Computer Security - I	2	2	-	1	50	-
Total			**22**	**26**			**550**	

Examination and Passing Criteria

- **Internal Examination Marks Ratio: 50% of Total Marks.**
- **External Examination Marks Ratio: 50% of Total Marks.**
- **Passing Marks: 40% Marks in Internal as well as External Examination.**

Evaluation System

The Evaluation System Consist of two components:

1. **Continuous and comprehensive Evaluation (CCE) Formative (Internal)**
2. **Semester End Evaluation (SEE) – Summative (External)**

In, each course 50% marks is assign to CEE and rest of 50 % marks is Assign to SEE.

Continuous and comprehensive Evaluation (CCE):

- The 50% marks assign to CEE is distributed between the continuous classroom evaluation and mid-term evaluation.
- Subject-wise CCE will be undertaken by the concerned faculty member. The mode of evaluation will be decided by the faculty member concerned with the subject.
- Normally CCE consists of **class participation**, **case analysis and presentation**, **assignment**, **tutorials, slip tests (announced/surprised), quizzes, attendance etc. or any combination of these.**
- The students are expected to submit their answer scripts/ reports of internal evaluation within the stipulated time. Failure to do so may result in the script not being valued.
- Another part of **CCE consists of mid-term written evaluation**, **which is compulsory for all students**. It can be done in a scheduled manner. The duration of the mid-term evaluation shall be one hour.

- Based on the types of evaluation, various models of evaluation implementation are suggested for theory, practical, self-study and work-based learning. The focus of these models is to encourage the students to improve on skills and performance.

Examination Pattern	**Marks**
Class Test (best 2 out of 3)	15
Quiz (Best 3 out of 4)	15
Active Learning	05
Class Assignment	05
Home Assignment	05
Attendance	05

Semester End Evaluation (SEE):

- The SEE carries 50% of the marks assigned to a course.
- SEE shall be of 2 hours for 4 credit course and 1 hour in case of 2 credit courses.
- The controller of the examination will conduct these examinations.
- Paper setting and evaluation will be done by the external examiners to an extent of 50% of the evaluation process.
- This examination shall be conducted as per a schedule which shall be notified in advance.
- The backlog exam will be conducted twice a year just after the result declared of the semester evaluation. Students shall have a second chance to clear their backlog and avoid the burden to carry forward the backlog with the next semester exam.

Eligibility Criteria to appear in SEE:

1. Should have at least 75% of attendance in all the courses put together
2. Should have at least 70% of attendance in each course/subject
3. Should not have any disciplinary proceedings pending against him/her
4. Should have no pending due

Exit Options

1. After II Semester - Exit option with Certificate in Computer Applications.
   (With a minimum of 44 + 4 credits of Summer Internship)
2. After IV Semester - Exit option with Diploma in Computer Applications.
   (With a minimum of 88 + 4 credits of Summer Internship)
3. After VI Semester - Exit Option with Bachelor of Computer Applications Degree, BCA Degree.
   (With a minimum of 132 credits)
4. After VIII Semester - Award of Bachelor of Computer Applications Hons Degree, BCA (Hons.) Degree.
   (With 176 credits)

Semester: III	**Program Code:MGTUG201**
Course Code: MS23MJDSCBCA301	**Course Title:** Data Structure
Course Credits: 04	**Hours/Week:** 04
Exam Duration: 2 Hours	**Course Type:** Discipline Specific Course (MAJOR).
Internal Exam Marks: 50	**External Exam Marks:** 50

Course Outcome:

After Completion of course,

- Students will gain a comprehensive understanding of essential data structures, including arrays, linked lists, stacks, and queues, to efficiently organize and manipulate data.
- Students also Develop strong algorithmic problem-solving skills, enabling you to design and implement efficient algorithms for tasks such as searching, sorting, and traversing various data structures.

Total Teaching Hour: 40		
Sr. No.	**PARTICULAR**	**MARKS**
Unit - I	**Introduction to Searching and Sorting:** Sorting-Notation and Concepts, Time and Space Complexity, Asymptotic behavior. **Sorting**: Insertion Sort, Selection Sort, Bubble Sort, Merge Sort, Heap Sort, Quick Sort, Shell Sort, Radix Sort, and Summary of Sorting. **Searching:** Searching-Sequential & Binary Searching. **Hashing:** Hash Table Methods-Introduction, Hashing Functions, and Collision-Resolution Techniques.	25%
Unit - II	**Introduction to Data Structures:** Types of Data Structures, Linear & non-linear Data Structures **Linear Data Structures with Applications**: Storage Structures for arrays, stack definitions & concepts, operations on stacks, applications of Stacks-Recursion, Polish Expressions and their compilation. Queue-Representation of queue, types of queue. Operations and applications of queue.	25%
Unit - III	**Linked List Data Structures with Applications**: linked list definition and their linked storage representation, linked list-linked linear list-operation on linear list using singly linked storage structures, circularly linked list, doubly linked linear list, sorted linked list, applications of linked linear list-polynomial manipulation.	25%
Unit - IV	**Non Linear Data Structures with Applications:** Trees-Definitions and concepts, operations on Binary Trees, Traversal Algorithms, Storage Representation and Manipulation of Binary Trees-Linked & Threaded, Conversion Of General Trees To Binary Trees, Sequential and other representations of trees, applications of Trees. **Graphs-**Matrix representation of graphs, Breadth First Search, Depth First Search, Minimal Spanning Trees.	25%

Text & Reference Books:

1. An Introduction to Data Structure with Applications 2nd Edition Tremblay J. and Sorenson P., McGraw-Hill International Edition.
2. Introduction to Data Structure, Bhagat singh and Thomas Naps: Tata McGraw-Hill Publishing Co. Ltd., 1985.
3. Data Structures: Theory and Problems, K. K. PATEL & Kaushar Ghanchi, Books India Publication, Ahmedabad.
4. Tanenbaum, Data Structures using C & C++, PHI
5. Robert L. Kruse, Data Structures and Program Design in C, PHI
6. Mary E.S. Loomis, Data Management and file processing, PHI

University Question Paper Scheme			
Q.1	Unit-I	Descriptive/ Long questions with choice	10 Marks
Q.2	Unit-II	Descriptive/ Long questions with choice	10 Marks
Q.3	Unit-III	Descriptive/ Long questions with choice	10 Marks
Q.4	Unit-IV	Descriptive/ Long questions with choice	10 Marks
Q.5	All Unit	Objective / Short Question / True –False etc.	10 Marks

Semester: III	**Program Code:MGTUG201**
Course Code: MS23MJDSCBCA301A	**Course Title:** Relational Database Management System
Course Credits: 04	**Hours/Week:** 04
Exam Duration: 2 Hours	**Course Type:** Discipline Specific Course (MAJOR).
Internal Exam Marks: 50	**External Exam Marks:** 50

Course Outcome:

After Completion of course,

- Students will attain a high level of proficiency in SQL, encompassing complex queries, sub queries, joins, and aggregate functions for effective data retrieval and manipulation.
- Students can acquire expertise in PL/SQL programming, enabling the creation of stored procedures, triggers, and functions for efficient data processing within the Oracle database environment.
- Students can develop techniques for optimizing SQL and PL/SQL code to enhance database performance through indexing, query tuning, and efficient execution plans.

Total Teaching Hour: 40		
Sr. No.	**PARTICULAR**	**MARKS**
Unit - I	**Transaction Management** ACID properties of transaction **Database concurrency** Three problems of concurrency Locking Problems of concurrency revisited Concept of Deadlocks **Database recovery** System Recovery, Media Recovery	25%
Unit - II	**Introduction to SQL** SQL Components, DDL, DML, DCL, TCL SQL constructs (SELECT... FROM...WHERE...GROUP BY....HAVING....ORDER BY...) **SQL Functions** String Functions, Conversion Functions, Numeric Functions, Aggregate Functions **Set Operators** **Union, Intersect, Minus** **Nested queries/ Sub Queries** **Correlated nested Queries** **Joins** Inner Join/ Simple Join, Outer Join **JOINs based on Operators** Equi Join, Non- Equi Join **Integrity constraints and its types(Domain, Entity, Referential)**	25%
Unit - III	**PL\SQL-Introduction** Data types, Syntax, Block Structures, Conditional Control in PL\SQL, Loops in PL/SQL	25%

	Cursors Explicit, Implicit **Error Handling in PL\SQL**	
Unit - IV	**Database Objects:** View Procedure Function Trigger Sequence	25%

Text & Reference Books:

1. Introduction to Database System by C. J. Date - Pearson Education
2. SQL, PL/SQL by Evan Bayross - BPB Publication

University Question Paper Scheme			
Q.1	Unit-I	Descriptive/ Long questions with choice	10 Marks
Q.2	Unit-II	Descriptive/ Long questions with choice	10 Marks
Q.3	Unit-III	Descriptive/ Long questions with choice	10 Marks
Q.4	Unit-IV	Descriptive/ Long questions with choice	10 Marks
Q.5	All Unit	Objective / Short Question / True –False etc.	10 Marks

Semester: III	**Program Code:MGTUG201**
Course Code: MS23PMJDSCBCA301B	**Course Title: Practical – Data Structure**
Course Credits: 02	**Hours/Week:** 04
Exam Duration: 2 Hours	**Course Type:** Discipline Specific Course (MAJOR).
Internal Exam Marks: 25	**External Exam Marks:** 25

Total Teaching Hour: 40
Practical List
1. Write a c program for linear search which find an element in an unsorted list.
2. Write a c program for binary search which find the location of a given element in a list.
3. Write a c program for sorting using bubble sort method.
4. Write a c program for sorting using quick sort. (Partition exchange sort) method.
5. Write a c program for sorting using straight selection sort.
6. Write a c program for sorting using insertion sort.
7. Write a c program for sorting using shell-sort method.
8. Write a c program for sorting using merge sort method.
9. Write a c program for sorting using radix sort method.
10. Write a c program for implementing of stack and its operation.
11. Write a c program which convert infix string to postfix string.
12. Write a c program which evaluates a postfix string.
13. Write a c program for implementing a simple queue and its operation.
14. Write a c program for implementing a double ended queue and its operation.
15. Write a c program for implementing a circular queue and its operation.
16. Write a c program for implementing a Singly linked list and its operation.
17. Write a c program for implementing a Doubly linked list and its operation.
18. Write a c program to insert an element into Sorted linked list.
19. Write a c program for creates a binary tree and its operation.
20. Write a c program for DFS and BFS technique.

University Practical Examination Scheme:

Examination Duration: **2 Hours (Per Batch)**

Practical Marks: **10** Viva Marks: **10** Journal Marks: **5**

Semester: III	**Program Code:MGTUG201**
Course Code: MS23PMJDSCBCA301C	**Course Title: Practical – RDBMS**
Course Credits: 02	**Hours/Week:** 04
Exam Duration: 2 Hours	**Course Type:** Discipline Specific Course (MAJOR).
Internal Exam Marks: 25	**External Exam Marks:** 25

Total Teaching Hour: 40

Practical List

Create following Three Tables.

1.Salesman

SNUM	SNAME	CITY	COMMISSION(%)
1001	PIYUSH	LONDON	12
1002	NIRAJ	SURAT	13
1003	MITI	LONDON	11
1004	RAJESH	BARODA	15
1005	ANAND	NEW DELHI	10
1006	RAM	PATAN	10
1007	LAXMAN	BOMBAY	09

SNUM: A Unique number assign to each salesman.

SNAME: The name of salesman.

CITY: The location of salesman.

COMMISSION: The percentage of salesman commission on order.

2.Customer

CNUM	CNAME	CITY	RATING	SNUM
2001	HARDIK	LONDON	100	1001
2002	GITA	ROME	200	1003
2003	LAXIT	SURAT	200	1002
2004	GOVIND	BOMBAY	300	1002
2005	CHANDU	LONDON	100	1001
2006	CHAMPAK	SURAT	300	1007
2007	PRATIK	ROME	100	1004

CNUM: A Unique number assign to each customer.

CNAME: The name of customer.

CITY: The location of customer.

RATING: A level of preference indicator given to this customer.

SNUM: A salesman number assign to this customer.

3.Order

ONUM	AMOUNT	ODATE	CNUM	SNUM
3001	18.69	10/03/99	2006	1007
3002	767.19	10/03/99	2001	1001
3003	1900.10	10/03/99	2007	1004
3004	5160.45	10/03/99	2003	1002
3005	1098.25	10/04/99	2006	1007
3006	1713.12	10/04/99	2002	1003
3007	75.75	10/05/99	2004	1002
3008	4723.00	10/05/99	2005	1001
3009	1309.95	10/05/99	2004	1002
3010	9898.87	10/06/99	2001	1001

ONUM: A Unique number assign to each Order.
AMOUNT: Amount of order in Rs.
ODATE: The date of order.
CNUM: The number of customer making the order.
SNUM: The number of salesman credited with the sale.

Solve following request with the help of SQL query.

1. Produce the order no, amount and date of all orders.
2. Give all the information about all the customers with salesman number 1001.
3. Display the information in the sequence of city, sname, snum, and Commission.
4. List of snum of all salesmen with orders in order table without duplicates.
5. List of all orders for more than Rs. 1000.
6. List out names and cities of all salesmen in London with commission above10%
7. List all customers excluding those with rating <= 100 or they are located in Rome.
8. List all order for more than Rs. 1000 except the orders of snum,1006 of 10/03/99
9. List all orders taken on 10th March, April and June 1999.
10. List all customers whose names begin with a letter 'C'.
11. List all customers whose names begins with letter 'A' to 'G'
12. List all orders with zero or NULL amount.
13. Find out the largest orders of salesman 1002 and 1007.
14. Calculate the Average and Sum of amount ordered.
15. Count the no. of salesmen currently having orders.
16. Find the largest order taken by each salesman on each date.
17. Find out each customer's smallest order.
18. Find out the customer in alphabetical order whose name begins with 'G'
19. Display the no. of order for each day in the following format. There are "X"(No. of Orders) Orders on "Y"(Date in dd-mon-yy).
20. Assume each salesperson has a 12% commission. Write a query on the order table that will Produce the Order number, salesman no and amount of commission for that order.
21. List all customers in descending order of rating.
22. Show the name of all customers with their salesman's name.
23. List all orders with the names of their customer and salesman.
24. List all orders by the customers not located in the same city as their salesman.
25. List all customers serviced by salesman with commission above 12%.

26. Find all pairs of customers having the same rating without duplication.
27. List all customers located in cities where salesman Niraj has customers.
28. List all salesmen who are living in the same city without duplicate rows.
29. Produce the name and city of all the customers with the same rating as Hardik'.
30. Extract all orders of Miti.
31. Find all orders of the salesman who services 'Hardik'
32. List all orders that are greater than the average of April 10, 1999
33. Count the no. of customers with the rating above than the average rating of 'Surat'.
34. Using correlated sub query find the name and number of all customers with rating equal to Maximum for their city.
35. Find all customers having rating greater than any customer in 'Rome'.
36. Find all the customers who have greater rating than every customer in 'Rome'.
37. Select all customers whose rating doesn't match with any rating customer of 'Surat'.
38. Create a union of two queries that shows the names, cities and ratings of all customers. Those with rating of >=200 should display 'HIGH RATING' and those with < 200 should Display 'LOW RATING'
39. Insert a row into salesmen table with the values snum is 1008 salesman name is Rakesh, City is unknown and commission is 14%.
40. Insert a row in to customer table with values London, Pratik a 2008 for the columns city, Name and number.
41. Create another table Londonstaff having same structure as salesman table.
42. Insert all the rows of salesmen table with city London in the London staff table.
43. Create another table Day totals with two attributes date and total and insert rows into this Table from order table.
44. Remove all orders from customer Chandu.
45. Increase the rating of all customers in Rome by 100.
46. Double the commission of all salesmen of London.
47. Delete the salesmen who produce the lowest order for each day.
48. Delete all customers with no current orders.
49. Write a command to add the item-name column to the order table.
50. Give the commands to create our sample tables (salesmen, customer, orders) with all the Necessary constraints like PRIMARY KEY, NOT NULL UNIQUE, FOREING KEY.
51. Create a view called big orders which stores all orders larger than Rs.4000.
52. Create a view that shows all the customers who have the highest ratings.
53. Create a view that shows all the number of salesman in each city.
54. Create a view that shows the average and total orders for each salesmen after his name And number.
55. Create a view Show name that shows for each order the order no, amount, salesman name And the customer name.

University Practical Examination Scheme:

Examination Duration: **2 Hours (Per Batch)**

Practical Marks: **10** Viva Marks: **10** Journal Marks: **5**

Semester: III	**Program Code:MGTUG201**
Course Code: MS23MDCBCA303	**Course Title:** Computer Network
Course Credits: 04	**Hours/Week:** 04
Exam Duration: 2 Hours	**Course Type:** Multi-Disciplinary Course
Internal Exam Marks: 50	**External Exam Marks:** 50

Course Outcome:

After Completion of course,

- Students will develop a solid understanding of computer network concepts, including architectures, protocols, and topologies.
- Students will gain practical skills in working with protocols such as TCP/IP, DNS, DHCP, HTTP, and FTP.
- Students will learn the principles and techniques involved in designing and implementing computer networks, including LANs, WANs, and wireless networks.

Total Teaching Hour: 40		
Sr. No.	**PARTICULAR**	**MARKS**
Unit - I	**Basic of Computer Networks:** Definitions of Network and Computer Network, Advantages and disadvantages of computer networking, Uses of Computer Network - Business Application, Home Application, Mobile Users **Components of a data communication network** Data, Sender, Receiver, Transmission medium, Protocol. Types of Networks - LAN ,MAN , WAN , PAN **Network Topology -** Star, Ring, Bus, Tree, Complete, Irregular, Hybrid topologies with advantages and disadvantages **Reference Models:** The OSI Reference Model, The TCP/IP reference model. **Telephone System:** History of Telephone System, Structure of Telephone System, The Local Loop, Transmission Impairment (Problem). **Multiplexing:** Frequency Division Multiplexing (FDM), Time Division Multiplexing (TDM), Wavelength Division Multiplexing (WDM). Difference :FDM, TDM **Switching:** Circuit Switching, Packet Switching, Message Switching. **Difference:** Circuit Switching & Packet Switching.	25%
Unit - II	**Transmission Media:** Definition of Computer Communication and Transmission media **Guided Media:** Twisted-pair cable, Coaxial cable, Fiber cable, Fiber optics principles, Transmission of light through Fiber, Difference of Fiber optics and copper wire. **Unguided Media OR Wireless Transmission:** The electromagnetic spectrum, Radio Transmission, Microwave Transmission, Infrared and	25%

	Millimeter Waves.	
Unit - III	**Common network connectivity devices:** **Routers:** Adaptive router and non-adaptive router **Bridges:** Transparent bridge, Spanning tree bridge, Remote bridge, Multiport bridge. **HUBs:** Passive HUB, Active Hub and Intelligent Hub. **Switches:** Simple switch, Folded switch, Cross-bar switch. **Gateways** **Repeater** **Data Link Protocols:** **Asynchronous Protocol:** Xmodem, Ymodem, Zmodem, BLAST, Kermit **Synchronous Protocols:** Character-oriented and Bit-Oriented protocol	25%
Unit - IV	**Network Layer in the Internet:** **IP Protocol:** IP Version 4, IP Version 6,IP Addresses , IP Address class , Network and Host Addressing ,Subnet ,Super netting **Internet Control Protocols**: ICMP, ARP, RARP,BOOTP and DHCP **Internet Transport Protocol:** UDP and TCP	25%

Text & Reference Books:

1. Computer Networks, A. S. Tanenbaum. PHI
2. Data Communications and Networking, Behrous A. Forouzan. TMH

University Question Paper Scheme			
Q.1	Unit-I	Descriptive/ Long questions with choice	10 Marks
Q.2	Unit-II	Descriptive/ Long questions with choice	10 Marks
Q.3	Unit-III	Descriptive/ Long questions with choice	10 Marks
Q.4	Unit-IV	Descriptive/ Long questions with choice	10 Marks
Q.5	All Unit	Objective / Short Question / True –False etc.	10 Marks

Semester: III	**Program Code:MGTUG201**
Course Code: MS23AECBCA304	**Course Title:** Environmental Science
Course Credits: 02	**Hours/Week:** 02
Exam Duration: 1 Hours	**Course Type:** Ability Enhancement Course (AEC)
Internal Exam Marks: 25	**External Exam Marks:** 25

Course Outcome:

After completion of course students able to,

- Understanding of environmental issues and fostering a sense of environmental responsibility and sustainability. Knowledge of environmental laws, policies, and regulations for informed decision-making and advocacy.
- Awareness of the interconnections between human activities and the environment, promoting sustainable practices. Understand Development of critical thinking and problem-solving skills to analyze and address environmental challenges.

Total Teaching Hour: 30		
Sr. No.	**PARTICULAR**	**MARKS**
Unit - I	**Environment: (3 lectures)** Meaning, definition, scope and its components. **Introduction to Environmental Studies (3 lectures)** •Multidisciplinary nature of environmental studies. •Scope and importance; Concept of sustainability and sustainable development. **Ecology and Ecosystems (5 lectures)** •Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology, ecological succession. **•Characteristic features of the following: (3 lectures)** a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)	50%
Unit - II	**Natural Resources (6 lectures)** • Concept of Renewable and Non-renewable resources • Land resources and land use change; Land degradation, soil erosion and desertification. •Deforestation: Causes, consequences and remedial measures •Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). •Energy resources: Environmental impacts of energy generation use of	50%

	alternative and nonconventional energy sources, growing energy needs. **Environmental Pollution (3 lectures)** • Environmental pollution: concepts and types. • Air, water, soil, noise and marine pollution- causes, effects and controls • Solid waste management. **Environmental Policies (6 lectures)** •Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture •Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention & Control of Pollution) Act; Environment Protection Act; Biodiversity Act	

Text & Reference Books:

1. Asthana, D. K. (2006).Text Book of Environmental Studies. S. Chand Publishing.
2. Basu, M., Xavier, S. (2016). Fundamentals of Environmental Studies, Cambridge University Press, India
3. Basu, R. N., (Ed.) (2000). Environment. University of Calcutta, Kolkata
4. Bharucha, E. (2013). Textbook of Environmental Studies for Undergraduate Courses. Universities Press.
5. De, A.K., (2006).Environmental Chemistry, 6th Edition, New Age International, New Delhi.
6. Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). Environment Reader for Universities, Centre for Science and Environment, New Delhi.
7. Masters, G. M., &Ela, W. P. (1991).Introduction to environmental engineering and science. Englewood Cliffs, NJ: Prentice Hall. Odum, E. P.,
8. Odum, H. T., & Andrews, J. (1971). Fundamentals of ecology. Philadelphia: Saunders.
9. Sharma, P. D., & Sharma, P. D. (2005).Ecology and environment. Rastogi Publications.

University Question Paper Scheme			
Q.1	UNIT-I	Descriptive/ Long questions with choice	10 Marks
Q.2	UNIT-II	Descriptive/ Long questions with choice	10 Marks
Q.3	All Unit	Objective / Short Question / True –False etc.	5 Marks

Note: The Question Paper will be in English Language Only but Students can answer in English or Hindi or Gujarati Language.

Field Visit can be arranged for Internal Assessment like

- Visit to an area to document environmental assets: Natural resources/flora/fauna, etc
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, fish, birds, mammals and basic principles of identification.
- Study of ecosystems-pond, river, wetland, forest, estuary and agro ecosystem

Semester: III	**Program Code:MGTUG201**
Course Code: MS23IKSBCA305	**Course Title:** Health Education
Course Credits: 02	**Hours/Week:** 02
Exam Duration: 1 Hours	**Course Type:** Indian Knowledge System (IKS)
Internal Exam Marks: 25	**External Exam Marks:** 25

Course Outcome:

After completion of course students able to,

- Acquire a comprehensive understanding of health concepts, including positive health, nutrition, and the impact of lifestyle choices.
- Demonstrate knowledge of the 3-tier healthcare system in India, environmental health issues, and epidemiology of both communicable and non-communicable diseases, enabling them to contribute to community well-being and public health initiatives.
- Equipped to implement school health services and programs, integrating the expertise of physical education teachers, principals, and healthcare professionals.

Total Teaching Hour: 30

Sr. No.	PARTICULAR	MARKS
Unit - I	• Concept of Health & Health education • **Health Education**- Aims, Principals, Contents and Methods. • Levels of Health Care in India 3-Tier system of health care. • **Positive health** : Meaning & Spectrums • **Role of Heredity & Environment** • **Nutrition** Proximate Principles, Balanced diet, Malnutrition • **Effects of Smoking, Drugs and Alcohol** • **School Health Services and Programme** Aspects, Role of P.E. Teacher, Principal and Doctor	50%
Unit - II	• **Community & Environmental Health** • **Pollution**: Causes, Effects on Health, Air Pollution, Water Pollution, Noise Pollution • **Occupational Hazards** • **Housing** • **Population** Policy, Explosion, Dynamic and Family Welfare Programme • **Epidemiology of Communicable Disease** Small & Chicken pox, Tuberculosis Mussels and Mumps , Malaria, Dengue, Chicken gunia Rabies, Jaundice, Yellow Fever • **Epidemiology of Non-Communicable Disease** Coronary Heart Disease (CHD), Cancer Diabetes, Hypertension • **Sexually Transmitted Diseases**	50%

Text & Reference Books:

1. Park J.E., Park K. Text Book for preventive and social MedicineJabalpur : Message Banarasidas Bhanet 1980 Edn.8
2. Turner C.E. The School Health and health Education (st. Louis: The C.V. Mosby Co. 1952) Edn. 2
3. Bedi, Yashpal, Social and preventive Medicine (Delhi: Atamaram & Sons 1983).

University Question Paper Scheme			
Q.1	UNIT-I	Descriptive/ Long questions with choice	10 Marks
Q.2	UNIT-II	Descriptive/ Long questions with choice	10 Marks
Q.3	All Unit	Objective / Short Question / True –False etc.	5 Marks

Note: The Question Paper will be in English Language Only but Students can answer in English or Hindi or Gujarati Language.

Semester: III	**Program Code:MGTUG201**
Course Code: MS23SECBCA306	**Course Title:** Computer Security - I
Course Credits: 02	**Hours/Week:** 02
Exam Duration: 1 Hours	**Course Type:** Skill Enhancement Course
Internal Exam Marks: 25	**External Exam Marks:** 25

Course Outcome:

After Completion of course Students able to,

- Apply practical knowledge of cyber security principles, including risk assessment, vulnerability analysis, and the deployment of effective countermeasures to safeguard computer systems and networks.
- Demonstrate proficiency in configuring and managing firewall systems to control and monitor network traffic, protecting against unauthorized access and potential security breaches.
- Analyze, identify, and mitigate the impact of various forms of malicious software, including viruses, worms, and ransom ware, through the use of antivirus tools and proactive security strategies.

Total Teaching Hour: 20		
Sr. No.	**PARTICULAR**	**MARKS**
Unit - I	**Security Basics:** Introduction, Definition & meaning of Computer Security, Confidentiality, Integrity, Availability, Computer criminals **Computer crimes:** definition and types of computer crime, Attack and its types, Method of Defense **Cyber Security:** Introduction to cyber security, Requirement and needs of Information Security in global business **Organizational Security**: Definition & Concept, People as a Security Tools, Physical Security	50%
Unit - II	**System Security-I:** **Intruders:** Introduction to Intruders, computer Intruders, Intrusion Detection functions **Malicious Software:** Viruses & Related threats **Firewall:** Introduction to Firewall, Characteristics & Limitations of Firewall, Types of Firewall	50%

Text & Reference Books:

1. Computer & Network Security, Gujarat Technical Publishers code. 3350704 Authors : Mr. Uresh Parmar, Prof. R.M. Shaikh, Dr. Paresh Kotak
2. Computer Security Basics by Debby Rusell, G.T. Gangemi (Orielly)
3. Network Security Private Communication in a Public world by Charlie Kamafman, Radia

Parolman, Mike Speciner

University Question Paper Scheme			
Q.1	UNIT-I	Descriptive/ Long questions with choice	10 Marks
Q.2	UNIT-II	Descriptive/ Long questions with choice	10 Marks
Q.3	All Unit	Objective / Short Question / True –False etc.	5 Marks