



પરિપત્ર:

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટીની સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજોનાં આચાર્યશ્રીઓને સવિનય જણાવવાનું કે સાયન્સ વિદ્યાશાખા હેઠળનો NEP-૨૦૨૦ અંતર્ગતનો કોમ્પ્યુટર સાયન્સ વિષયનો (બી.સી.એ વિથ ઓનર્સ) નો સેમેસ્ટર-૩ અને સેમેસ્ટર-૪ નો અભ્યાસક્રમ આ સાથે સામેલ છે.

માનનીય કુલપતિશ્રીની મંજૂરી અનુસાર સદર અભ્યાસક્રમ શૈક્ષણિક વર્ષ જુન,૨૦૨૪ થી અમલવારી કરવાની રહે છે. સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજો ધ્વારા તેની અમલવારી કરવા જણાવવામાં આવે છે.



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૧૧/૦૬/૨૦૨૪

ખાસ ફરજ પરના અધિકારી  
(એકેડેમિક)

ક્રમાંક/બીકેએનએમયુ/ એકેડેમિક/૭૧૦/૨૦૨૪

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી,

સરકારી પોલીટેકનિક કેમ્પસ,

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી રોડ,

ખડીયા, જૂનાગઢ-૩૬૨૨૬૩

તા.૧૯/૦૬/૨૦૨૪

પ્રતિ,

- ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી સંલગ્ન સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમો ચલાવતી તમામ કોલેજોના આચાર્યશ્રીઓ તરફ....

નકલ સાદર રવાના:-

- માન.કુલપતિશ્રી/કુલસચિવશ્રીનાં અંગત સચિવશ્રી.
- પરીક્ષા નિયામકશ્રી, ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી, જૂનાગઢ

નકલ રવાના જાણ તથા યોગ્ય કાર્યવાહી અર્થે:

- સીસ્ટમ મેનેજરશ્રી, આઇ.ટી.સેલ વિભાગ (વેબસાઇટ ઉપર પ્રસિદ્ધ થવા અર્થે.)



**BHAKTA KAVI NARSINH MEHTA UNIVERSITY  
JUNAGADH**



**BOARD OF COMPUTER SCIENCE STUDIES**

**FACULTY OF SCIENCE**

**SYLLABUS FOR**

**B.C.A (HONOURS) PROGRAMME**

**(SEMESTER- III & IV)**

**MAJOR/MINOR/MULTIDISCIPLINARY**

**EFFECTIVE FROM JUNE, 2024**

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**

Major/Minor/Multidisciplinary

Syllabus of B.C.A.(Honors) as per NEP-2020

Faculty of Science

Effective from June 2024

Subject: Computer Science

SEMESTER-III &amp; IV

**SUMMARY OF THE SYLLABUS**

Sem No.	Sr. No.	Category of Course	Course Title	Course Level	Credit	Teaching Hrs.	SEE Marks	CCE Marks	Total Marks	Exam Duration
Sem-3	1	Major-5	OOP Concepts using C++ (Theory)	5.0	Theory 4 Practical 0	Theory-60 Practical-0	50	50	100	2:00 Hrs
	2	Major-6	OOP Concepts using C++ (Practical)	5.0	Theory 0 Practical 4	Theory-0 Practical-120	50	50	100	2:00 Hrs
	3	Major-7	DBMS - I	5.0	Theory 3 Practical 1	Theory- 45 Practical-30	50	50	100	2:00 Hrs
	4	MDC-3	Mathematics	5.0	Theory 4 Practical 0	Theory- 60 Practical-0	50	50	100	2:00 Hrs
					<b>Total</b>	<b>16</b>				

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**SEM-III**

<b>Course Level</b>	5.0	<b>Internal Marks</b>	50
<b>Programme</b>	Bachelor of Computer Application	<b>External Marks</b>	50
<b>Semester</b>	III	<b>Practical Internal</b>	0
<b>Category of Course</b>	Major-5	<b>Practical External</b>	0
<b>Course Credit</b>	4	<b>Prac. External Exam Duration</b>	-
<b>Teaching Hours</b>	Theory-60 Practical-0	<b>Total</b>	100
<b>Course Code</b>		<b>Exam Duration</b>	2:00 Hrs
<b>Course Title</b>	<b>OOP Concepts using C++ (Theory)</b>		

**Course Objectives:**

1. To impart the concept of OOPs
2. To make the learners be able to simulate the real-world situation into programming
3. To impart the concept of polymorphism and inheritance

**Course Learning Outcomes:**

1. Gaining familiarity with Object Oriented Programming
2. Having ability to simulate real world situation into object orientation
3. Being able to understand and implement OOP practices

**Course Contents**

<b>Sem</b>	<b>Unit No.</b>	<b>Syllabus</b>	<b>Teaching Hours</b>
3	1	<ul style="list-style-type: none"> <li>• Procedure – Oriented Programming v/s Object oriented programming</li> <li>• Basic concepts and benefits of object-oriented Programming</li> <li>• What is C++?</li> <li>• Structure of C++ program</li> <li>• <b>Tokens:</b> Keywords, identifiers, basic data types, user-defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables</li> </ul>	15

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		<ul style="list-style-type: none"><li>• <b>Operators in C++:</b> Input/output operators, Scope resolution operator, member referencing operator, memory management operator, manipulators, and type cast operator.</li><li>• <b>Expression:</b> Expression and their types, special assignment operator, implicit conversions</li><li>• <b>Control structures:</b><ul style="list-style-type: none"><li>○ Conditional control structure: Simple if, if...else, nested if else, switch etc.</li><li>○ Looping control structure: for, while, do...while</li></ul></li><li>• <b>Functions in C++:</b><ul style="list-style-type: none"><li>○ The main function</li><li>○ Function prototype</li><li>○ Call by reference</li><li>○ Return by reference</li><li>○ Inline function</li><li>○ Default arguments</li><li>○ Functions overloading</li></ul></li></ul>	
	2	<ul style="list-style-type: none"><li>• <b>Concept of class:</b><ul style="list-style-type: none"><li>○ Definition and specification</li><li>○ Local Classes, Nested Classes</li></ul></li><li>• <b>Declaring member variables and member functions</b><ul style="list-style-type: none"><li>○ Access Specifiers: public, private, protected</li><li>○ Static data member</li><li>○ Array within a class</li><li>○ nesting of Member functions</li><li>○ Friend functions</li><li>○ making outside function inline</li></ul></li><li>• <b>Objects:</b><ul style="list-style-type: none"><li>○ Concept of object</li><li>○ Memory allocation for objects</li><li>○ Arrays of objects</li><li>○ Objects as function arguments</li><li>○ Returning objects from functions</li></ul></li><li>• <b>Constructors:</b><ul style="list-style-type: none"><li>○ Concept and features of constructor</li><li>○ Multiple constructors in a class</li><li>○ Parameterized constructor</li></ul></li></ul>	15

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		<ul style="list-style-type: none"><li>○ Constructor with default argument</li><li>○ Copy constructor</li><li>○ Dynamic constructor</li><li>○ Explicit constructor</li><li>○ Dynamic initialization of objects</li><li>● <b>Destructors</b><ul style="list-style-type: none"><li>○ Concept, definition and call mechanism</li></ul></li></ul>	
	3	<ul style="list-style-type: none"><li>● <b>operator overloading:</b><ul style="list-style-type: none"><li>○ Definition and concept</li><li>○ Rules for operator overloading</li><li>○ Over loading unary and binary operators</li><li>○ Overloading of operators using friend Function</li><li>○ Manipulation of string using operators</li><li>○ Type conversions.</li><li>○ Comparison of different method of conversion</li></ul></li><li>● <b>Inheritance:</b><ul style="list-style-type: none"><li>○ Definition and concept</li><li>○ Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)</li><li>○ Defining derived classes</li><li>○ Constructors in derived class</li><li>○ Virtual base class</li><li>○ Concept and implementation of virtual functions</li><li>○ Containership, Inheritance V/s Containership</li></ul></li></ul>	15
	4	<ul style="list-style-type: none"><li>● <b>Pointers in OOP:</b><ul style="list-style-type: none"><li>○ Pointer as member variable</li><li>○ Pointer to Object</li><li>○ Pointer to derived class</li><li>○ this pointer</li></ul></li><li>● <b>File handling:</b><ul style="list-style-type: none"><li>○ Introduction and applications</li><li>○ File operations: open, read, write, seek and close</li></ul></li><li>● <b>Exception handling:</b><ul style="list-style-type: none"><li>○ Concept and need</li><li>○ Implementation using try, catch and throw</li></ul></li></ul>	15

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**Subject: Computer Science**

**SEMESTER-III & IV**

**Suggested Reading:**

<b>Reference Books: No.</b>	<b>Name</b>	<b>Author / Publication</b>
1	Mastering C++	Venugopal
2	Object Oriented programming in C++	Robert Lafore, Pearson Education
3	Object Oriented Programming in C++	E. Balagurusamy, BPB

**Web site References:**

<https://www.tutorialspoint.com/cplusplus>

<https://www.javatpoint.com/cpp-tutorial>

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Course Level	5.0	Internal Marks	0
Programme	Bachelor of Computer Application	External Marks	0
Semester	III	Practical Internal	50
Category of Course	Major-6	Practical External	50
Course Credit	4	Prac. External Exam Duration	2:00 Hrs
Teaching Hours	Theory-0 Practical-120	Total	100
Course Code		Exam Duration	-
Course Title	<b>OOP Concepts using C++ (Practical)</b>		

**Course Objectives:**

1. To impart the concept of OOPs
2. To make the learners be able to simulate the real-world situation into programming
3. To impart the concept of polymorphism and inheritance

**Course Learning Outcomes:**

1. Gaining familiarity with Object Oriented Programming
2. Having ability to simulate real world situation into object orientation
3. Being able to understand and implement OOP practices

**Course Contents**

Sem	Unit No.	Syllabus	Teaching Hours
3	1	<ul style="list-style-type: none"> <li>• Procedure – Oriented Programming v/s Object oriented programming</li> <li>• Basic concepts and benefits of object-oriented Programming</li> <li>• What is C++?</li> <li>• Structure of C++ program</li> <li>• <b>Tokens:</b> Keywords, identifiers, basic data types, user-defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables</li> <li>• <b>Operators in C++:</b> Input/output operators, Scope resolution operator, member referencing operator,</li> </ul>	30

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		<p>memory management operator, manipulators, and type cast operator.</p> <ul style="list-style-type: none"><li>• <b>Expression:</b> Expression and their types, special assignment operator, implicit conversions</li><li>• <b>Control structures:</b><ul style="list-style-type: none"><li>○ Conditional control structure: Simple if, if...else, nested if else, switch etc.</li><li>○ Looping control structure: for, while do...while</li></ul></li><li>• <b>Functions in C++:</b><ul style="list-style-type: none"><li>○ The main function</li><li>○ Function prototype</li><li>○ Call by reference</li><li>○ Return by reference</li><li>○ Inline function</li><li>○ Default arguments</li><li>○ Functions overloading</li></ul></li></ul>	
	2	<ul style="list-style-type: none"><li>• <b>Concept of class:</b><ul style="list-style-type: none"><li>○ Definition and specification</li><li>○ Local Classes, Nested Classes</li></ul></li><li>• <b>Declaring member variables and member functions</b><ul style="list-style-type: none"><li>○ Access Specifiers: public, private, protected</li><li>○ Static data member</li><li>○ Array within a class</li><li>○ nesting of Member functions</li><li>○ Friend functions</li><li>○ making outside function inline</li></ul></li><li>• <b>Objects:</b><ul style="list-style-type: none"><li>○ Concept of object</li><li>○ Memory allocation for objects</li><li>○ Arrays of objects</li><li>○ Objects as function arguments</li><li>○ Returning objects from functions</li></ul></li><li>• <b>Constructors:</b><ul style="list-style-type: none"><li>○ Concept and features of constructor</li><li>○ Multiple constructors in a class</li><li>○ Parameterized constructor</li><li>○ Constructor with default argument</li><li>○ Copy constructor</li><li>○ Dynamic constructor</li></ul></li></ul>	30

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		<ul style="list-style-type: none"><li>○ Explicit constructor</li><li>○ Dynamic initialization of objects</li><li>● <b>Destructors</b><ul style="list-style-type: none"><li>○ Concept, definition and call mechanism</li></ul></li></ul>	
	3	<ul style="list-style-type: none"><li>● <b>Operator overloading:</b><ul style="list-style-type: none"><li>○ Definition and concept</li><li>○ Rules for operator overloading</li><li>○ Over loading unary and binary operators</li><li>○ Overloading of operators using friend Function</li><li>○ Manipulation of string using operators</li><li>○ Type conversions.</li><li>○ Comparison of different method of conversion</li></ul></li><li>● <b>Inheritance:</b><ul style="list-style-type: none"><li>○ Definition and concept</li><li>○ Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)</li><li>○ Defining derived classes</li><li>○ Constructors in derived class</li><li>○ Virtual base class</li><li>○ Concept and implementation of virtual functions</li><li>○ Containership, Inheritance V/s Containership</li></ul></li></ul>	30
	4	<ul style="list-style-type: none"><li>● <b>Pointers in OOP:</b><ul style="list-style-type: none"><li>○ Pointer as member variable</li><li>○ Pointer to Object</li><li>○ Pointer to derived class</li><li>○ this pointer</li></ul></li><li>● <b>File handling:</b><ul style="list-style-type: none"><li>○ Introduction and applications</li><li>○ File operations: open, read, write, seek and close</li></ul></li><li>● <b>Exception handling:</b><ul style="list-style-type: none"><li>○ Concept and need</li><li>○ Implementation using try, catch and throw</li></ul></li></ul>	30

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**SEMESTER-III & IV**

**Suggested Reading:**

<b>Reference Books: No.</b>	<b>Name</b>	<b>Author / Publication</b>
1	Mastering C++	Venugopal
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**Web site References:**

<https://www.tutorialspoint.com/cplusplus/>

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<b>Course Level</b>	5.0	<b>Internal Marks</b>	25
<b>Programme</b>	Bachelor of Computer Application	<b>External Marks</b>	50
<b>Semester</b>	III	<b>Practical Internal</b>	25
<b>Category of Course</b>	Major-7	<b>Practical External</b>	0
<b>Course Credit</b>	IV	<b>Prac. External Exam Duration</b>	-
<b>Teaching Hours</b>	Theory- 45 Practical-30	<b>Total</b>	100
<b>Course Code</b>		<b>Exam Duration</b>	2:00 Hrs
<b>Course Title</b>	<b>DBMS - I</b>		

**Course Objectives:**

1. To impart the know-how of Data, Data Base and DBMS
2. To make the learners aware about the collection, organisation and management of data
3. To impart how to query data stored in database

**Course Learning Outcomes:**

1. Getting familiar with data management concepts
2. Gaining understanding about organising and managing data
3. Being able to authenticate and authorise data sources
4. Being able to obtain the desired datasets from the repository of data by querying them

**Course Contents**

<b>Sem</b>	<b>Unit No</b>	<b>Syllabus</b>	<b>Teaching Hours</b>
3	1	<ul style="list-style-type: none"> <li>● <b>Database:</b> <ul style="list-style-type: none"> <li>○ Introduction and types</li> <li>○ Basic terminology (Data (structured and unstructured), Information, field, record, file)</li> <li>○ Three levels of Architecture (external, conceptual and internal)</li> <li>○ Database Schema</li> </ul> </li> <li>● <b>DBMS:</b> <ul style="list-style-type: none"> <li>○ Introduction, Components, advantages, disadvantages, applications</li> <li>○ Structure of DBMS</li> </ul> </li> </ul>	10

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	<ul style="list-style-type: none"><li>○ Architecture of DBMS</li><li>● <b>RDBMS:</b><ul style="list-style-type: none"><li>○ Introduction and applications</li><li>○ Basic terminology (relation, tuple, attribute, domain)</li><li>○ E. F. Codd Rules</li><li>○ Difference between DBMS and RDBMS</li></ul></li><li>● <b>Data Models:</b><ul style="list-style-type: none"><li>○ Introduction</li><li>○ Types (Hierarchical, Network and Relational, Entity Relationship, Object based)</li></ul></li></ul>	
2	<ul style="list-style-type: none"><li>● <b>Normalization:</b><ul style="list-style-type: none"><li>○ Concept, need/Advantages and disadvantages</li><li>○ Types of Normal forms (1NF, 2NF, 3NF, BCNF)</li></ul></li><li>● <b>Relational Model:</b><ul style="list-style-type: none"><li>○ Concept, advantages, disadvantages</li><li>○ Relationship and its types</li><li>○ Various Data constraints</li><li>○ Concept of keys and its types (Super Key, Candidate key, primary key, alternate key, foreign key)</li></ul></li><li>● <b>Relational Algebra:</b><ul style="list-style-type: none"><li>○ Concept and uses</li><li>○ Fundamental Operators (selection, projection, intersection, union, minus)</li></ul></li></ul>	10
3	<ul style="list-style-type: none"><li>● <b>SQL:</b><ul style="list-style-type: none"><li>○ Introduction and applications</li><li>○ Datatypes, operators and expressions</li><li>○ Concept of CRUD operations</li><li>○ Query and subquery (definition, concept and example)</li></ul></li><li>● <b>SQL Commands:</b><ul style="list-style-type: none"><li>○ Concept and uses</li><li>○ Various categories of SQL Commands<ul style="list-style-type: none"><li>▪ <b>DDL (Data Definition Language)</b><ul style="list-style-type: none"><li>● Concept and uses</li><li>● DDL commands (create, drop, alter, truncate)</li></ul></li><li>▪ <b>DML (Data Manipulation Language)</b><ul style="list-style-type: none"><li>● Concept and uses</li><li>● DML commands (insert, update, delete)</li></ul></li></ul></li></ul></li></ul>	10

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**SEMESTER-III & IV**

	<ul style="list-style-type: none"> <li>▪ DQL (Data Query Language) <ul style="list-style-type: none"> <li>• Concept and uses</li> <li>• DQL command (select)</li> </ul> </li> <li>▪ DCL (Data Control Language) <ul style="list-style-type: none"> <li>• Concept and uses</li> <li>• Creating user</li> <li>• DCL commands (grant, revoke)</li> </ul> </li> <li>▪ TCL (Transaction Control Language) <ul style="list-style-type: none"> <li>• Concept and uses</li> <li>• TCL commands ((commit, rollback, savepoint)</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• <b>SQL *PLUS:</b> <ul style="list-style-type: none"> <li>○ Concept</li> <li>○ Working with SQL *PLUS</li> </ul> </li> </ul>	
4	<ul style="list-style-type: none"> <li>• <b>SQL Operators:</b> <ul style="list-style-type: none"> <li>○ Logical (and, or, in, like, between, exists)</li> <li>○ Set (union, union all, intersect, minus)</li> </ul> </li> <li>• <b>SQL join:</b> <ul style="list-style-type: none"> <li>○ Concept and uses</li> <li>○ Types of join (inner, outer, self)</li> </ul> </li> <li>• <b>SQL Role:</b> <ul style="list-style-type: none"> <li>○ Concept and uses</li> <li>○ Commands (create role, alter role, drop role, grant, revoke)</li> </ul> </li> <li>• <b>SQL Functions:</b> <ul style="list-style-type: none"> <li>○ Numeric Function (abs, ceil, exp, floor, greatest, max, min, round, sqrt)</li> <li>○ Character Function (chr, concat, initcap, lower, upper, ltrim, rtrim, trim, replace, substr)</li> <li>○ Date Function (add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char</li> <li>○ Aggregate function (Sum, Count, Avg, Max, Min)</li> </ul> </li> </ul>	15
<b>Practical</b>		30

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**

**Major/Minor/Multidisciplinary**

**Syllabus of B.C.A.(Honors) as per NEP-2020**

**Faculty of Science**

**Effective from June 2024**

**Subject: Computer Science**

**SEMESTER-III & IV**

**Suggested Reading:**

<b>Reference Books: No.</b>	<b>Name</b>	<b>Author / Publication</b>
1	Oracle Database the Complete Reference	Bob Bryla, Kevin Loney –Oracle Press
2	Oracle Database SQL	Jason Price –Oracle Press

**Web site References:**

<https://www.geeksforgeeks.org/sql-tutorial/>

<https://www.javatpoint.com/sql-tutorial>

<https://www.tutorialspoint.com/sql/index.htm>

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**

Major/Minor/Multidisciplinary

Syllabus of B.C.A.(Honors) as per NEP-2020

Faculty of Science

Effective from June 2024

Subject: Computer Science

SEMESTER-III &amp; IV

Course Level	5.0	Internal Marks	50
Programme	Bachelor of Computer Application	External Marks	50
Semester	III	Practical Internal	0
Category of Course	MDC-3	Practical External	0
Course Credit	IV	Prac. External Exam Duration	-
Teaching Hours	Theory-60 Practical-0	Total	100
Course Code		Exam Duration	2:00 Hrs
Course Title	<b>Mathematics</b>		

**Course Objectives:**

1. To impart the knowledge of mathematical concepts to learners
2. To make learners aware about the possible application of mathematics to problem solving

**Course Learning Outcomes:**

1. Gaining the knowledge of mathematical computations
2. To be able to solve the computational problems using practical mathematical implementation

**Course Contents**

Sem	Unit No.	Syllabus	Teaching Hours
3	1	<ul style="list-style-type: none"> <li>• <b>Set Theory:</b> <ul style="list-style-type: none"> <li>○ Introduction and types</li> <li>○ Representation of set</li> <li>○ Properties</li> <li>○ De 'Morgan laws with proof</li> <li>○ Operations (Union, intersection, Difference, Complement, Cartesian products (up to two sets))</li> <li>○ Typical examples</li> </ul> </li> <li>• <b>Co-ordinate Geometry:</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Quadrants &amp; Axes</li> <li>○ Distance between two points in R<sup>2</sup>(without proof)</li> </ul> </li> </ul>	15

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SEMESTER-III &amp; IV

		<ul style="list-style-type: none"><li>○ Section formula (without proof)</li><li>○ Area of triangle (without proof)</li><li>○ Typical examples</li></ul>	
2	<ul style="list-style-type: none"><li>● <b>Matrices:</b><ul style="list-style-type: none"><li>○ Introduction</li><li>○ Different types of matrix (square matrix, column matrix, row matrix, Diagonal matrix. Unit matrix, null matrix)</li><li>○ Transpose of matrix</li><li>○ Addition, subtraction &amp; multiplication of two matrices</li><li>○ Adjoint of a square matrix</li><li>○ determinant of matrices up to order 3</li><li>○ Inverse of matrix</li></ul></li></ul>	15	
3	<ul style="list-style-type: none"><li>● <b>Data Analysis:</b><ul style="list-style-type: none"><li>○ Frequency Distribution:<ul style="list-style-type: none"><li>▪ Definition and concept</li><li>▪ Graphs (Histogram, Bar Graph and Pie Chart)</li><li>▪ Table (ungrouped, grouped)</li></ul></li><li>○ Measures of Central Tendency:<ul style="list-style-type: none"><li>▪ Definition and concept</li><li>▪ Median (ungroup data, group data)</li><li>▪ Mode (ungroup data, group data)</li><li>▪ Range</li></ul></li><li>○ Measure of dispersion:<ul style="list-style-type: none"><li>▪ Definition and concept</li><li>▪ Mean deviation</li><li>▪ Standard deviation</li><li>▪ Quartile Deviation</li></ul></li></ul></li></ul>	15	
4	<ul style="list-style-type: none"><li>● <b>Probability:</b><ul style="list-style-type: none"><li>○ Definition, concept and applications</li><li>○ Terms (Sample Space, experiment, event, outcome)</li><li>○ Probability of an event and its types</li><li>○ Different Probability Formulas with example</li></ul></li></ul>	15	

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**

**Major/Minor/Multidisciplinary**

**Syllabus of B.C.A.(Honors) as per NEP-2020**

**Faculty of Science**

**Effective from June 2024**

**Subject: Computer Science**

**SEMESTER-III & IV**

**Suggested Reading:**

<b>Reference Books:No.</b>	<b>Name</b>	<b>Author / Publication</b>
1	Business Mathematics	Sancheti & Kapoor by Sultan & Chand
2	Statistical Method	Gupta by Sultan & Chand

**Website References:**

<https://www.geeksforgeeks.org/maths/>

<https://www.tutorialspoint.com/statistics/index.htm>

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**Ability Enhancement Course (AEC)**  
**Syllabus of English subject for Faculty of Science as per NEP**  
**Effective from June 2024**  
**Subject: English for Science Faculty**  
**SEMESTER-3**

<b>Course Level</b>	5.0	<b>Internal Marks</b>	25
<b>Programme</b>	Science	<b>External Marks</b>	25
<b>Semester</b>	3	<b>Practical Internal</b>	-
<b>Course Type</b>	Ability Enhancement Skill-3	<b>Practical External</b>	-
<b>Course Credit</b>	02	<b>Prac.Ext.Exam Time</b>	-
<b>Teaching Hours</b>	30	<b>Total</b>	50
<b>Course Code</b>		<b>Exam Duration</b>	1 Hour
<b>Course Title</b>	English Language and Grammar-1		

**Course Objectives:**

- To make students able to comprehend literary texts for developing their critical thinking.
- To develop basic proficiency in English Writing Skill.
- To make students able to understand usage of English language in expressing various ideas.
- To enable students for writing various kinds of reports.
- To explain essentials of grammar for strengthening students' language.

**Course Learning Outcomes:** After completion of the course:

- Students will be able to understand usage of English in expressing various ideas
- Students will be able to compose reports
- Students will be able to understand purpose of fiction and non-fiction writing.
- Students will be able to grasp basic grammar of changing the voice of a sentence.

## Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
3	1	<b>Short stories:</b> The Secret of Culture by Munshi Premchand <a href="https://www.arvindguptatoys.com/arvindgupta/ruskin-stories.pdf">https://www.arvindguptatoys.com/arvindgupta/ruskin-stories.pdf</a> The Last Question by Issac Asimov <a href="https://users.ece.cmu.edu/~gamvrosi/thelastq.html">https://users.ece.cmu.edu/~gamvrosi/thelastq.html</a> <b>Essays:</b> Why We Crave Horror Movies by Stephen King <a href="https://faculty.uml.edu/bmarshall/lowell/whywecravehorrormovies.pdf">https://faculty.uml.edu/bmarshall/lowell/whywecravehorrormovies.pdf</a> Ebooks v paper by Julian Baggini <a href="https://www.ft.com/content/53d3096a-f792-11e3-90fa-00144feabdc0#axzz35eMWcGoS">https://www.ft.com/content/53d3096a-f792-11e3-90fa-00144feabdc0#axzz35eMWcGoS</a>	15
	2	<b>Grammar:</b> Active-Passive voices <b>Composition:</b> Report writing (List of topics has been given)	15

### Suggested Reading:

1. Intermediate English Grammar: Reference and Practice for South Asian Students by Raymond Murphy. Cambridge University Press
2. Business Communication by Urmila Rai and S.M. Rai. Himalaya Publishing House
3. Effective Technical Communication by M Ashraf Rizvi. Tata Mc Graw hill
4. Spoken English: A Foundation Course by Kamlesh Sadanand and Susheela Punitha (Part I and Part II)

### Topics for report writing:

1. **Cultural Festivals:** Describe a cultural festival celebrated in your community or country.
2. **Sports Events:** Report on a recent sports event such as a cricket match, football game, or tennis tournament.
3. **Concerts or Music Festivals:** Write about a concert or music festival you attended, describing the performers and atmosphere.
4. **School or University Events:** Report on a school play, science fair, or university lecture.
5. **Art Exhibitions:** Write about an art exhibition you visited, discussing the artworks and artists.
6. **Charity Events:** Report on a charity run, fundraiser, or volunteer activity you participated in.
7. **Film Screenings or Premieres:** Describe a film screening or premiere you attended, discussing the movie and audience reactions.

- 8. Science or Technology Conferences:** Write about a conference or expo focused on science, technology, or innovation.
- 9. Book Fairs or Literary Events:** Report on a book fair or literary event you attended, discussing authors and books.

<b>INTERNAL EVALUATION SCHEME</b>		
<b>NO</b>	<b>Particulars</b>	<b>Marks</b>
1	<b>Mid Semester Exam(Mandatory)</b>	<b>13</b>
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03
13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
	<b>Total</b>	<b>25</b>

**Note: Sr.No.1 is mandatory. Select any Four from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam.**

## Paper Style

<b>Ques. No.</b>	<b>Particulars</b>	<b>From which Unit</b>	<b>Marks</b>
<b>1</b>	Short notes based on texts, any 2 from asked 4.	<b>1</b>	<b>10</b>
<b>2</b>	(A) Change the voice.- any 5 from given 7 (B) Write a report, any 1 from given 2.	<b>2</b>	<b>10</b>
<b>3</b>	Students will answer <u>5 MCQ/One liner</u> question from seven asked, each carrying 1 mark.	<b>1</b>	<b>05</b>
		<b>Total Marks</b>	<b>25</b>

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**Skill Enhancement Course (SEC)**  
**Syllabus for Faculty of Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-3**

Course Level	5.0	Internal Marks	12
Programme	B.Sc (Honours)	External Marks	25
Semester	3	Practical Internal	13
Course Type	Skill Enhancement Course-3	Practical External	-
Course Credit	02	Prac. Ext. Exam Time	-
Teaching Hours	Theory-15 Practical-30	Total	50
Course Code		Exam Duration	1 Hour
Course Title	CMS with WordPress		

**Course Objectives:** On successful completion of the course, the students will be able to:

- To impart basic knowledge about content management and blogging
- To impart the know how about web site development
- To demonstrate the learners how to use advanced techniques in web site designing

**Course Learning Outcomes:** On successful completion of the course, the students will be able to:

- Being able to create own blogging site
- Having technical know-how to design and develop organized web content

**Course Contents**

Sem	Unit No.	Syllabi	Teaching Hours
3	1	<ul style="list-style-type: none"> <li>• <b>Content Management System:</b> <ul style="list-style-type: none"> <li>○ Introduction, Features, Advantages, Disadvantages, Applications</li> <li>○ Basics of Blogging</li> </ul> </li> <li>• <b>WordPress:</b> <ul style="list-style-type: none"> <li>○ Introduction, Features, Advantages, Disadvantages</li> <li>○ Installation of WordPress.</li> <li>○ WordPress Directory &amp; file structure.</li> <li>○ Dashboard overview</li> <li>○ working with page, category, post, tags, and media</li> <li>○ User Roles and Responsibilities</li> <li>○ Modifying Settings (General, Reading, Writing, Discussion, Media, Permalinks)</li> <li>○ Database Structure</li> </ul> </li> </ul>	<b>05</b>
	2	<ul style="list-style-type: none"> <li>• <b>Theme:</b> <ul style="list-style-type: none"> <li>○ Introduction, installation and activation</li> </ul> </li> </ul>	<b>10</b>

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**Skill Enhancement Course (SEC)**  
**Syllabus for Faculty of Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-3**

	<ul style="list-style-type: none"> <li>○ Common WordPress themes and Template files</li> <li>● <b>Widget:</b> <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Widget Areas and Widget Management</li> <li>○ Available Widgets (Archive, Calendar, Categories, Custom Menu, Meta, Pages, Recent Comments, Recent Posts, RSS, Search, Tag Cloud, Text)</li> </ul> </li> <li>● <b>Plugins:</b> <ul style="list-style-type: none"> <li>○ Introduction, installation and activation</li> <li>○ Useful Plugins (SEO Yoast, Google Analytics, WooCommerce, Page Builder)</li> </ul> </li> </ul>	
3	<b>Practical</b>	<b>30</b>

**Suggested Reading:**

1. Teach Yourself VISUALLY Word Press, 3rd Edition, George Plumley
2. Build Your Own WordPress Website: An Ultimate Guide for Small Business Owners, Paperback by WordPress Genie

**Website References:**

1. <https://www.tutorialspoint.com/wordpress/>
2. <https://www.wpbeginner.com/category/wp-tutorials/>
3. <https://www.siteground.com/tutorials/wordpress/>
4. <https://learn.wordpress.com/>

<b>INTERNAL EVALUATION SCHEME</b>		
NO	Particulars	Marks
1	<b>Mid Semester Exam (Mandatory)</b>	<b>13</b>
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**Skill Enhancement Course (SEC)**  
**Syllabus for Faculty of Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-3**

13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
	<b>Total</b>	<b>25</b>

**Note: Sr.No.1 is mandatory. Select any Four from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam**

**Paper Style**

<b>Ques. No.</b>	<b>Particulars</b>	<b>From which Unit</b>	<b>Marks</b>
<b>1</b>	Questions (Any Two Out Of Four)	1	<b>10</b>
<b>2</b>	Questions (Any Two Out Of Four)	2	<b>10</b>
<b>3</b>	Questions (Any One Out Of Two)	From Each Unit	<b>05</b>
		<b>Total Marks</b>	<b>25</b>

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**VALUE ADDED COURSE (VAC)**  
**INDIAN KNOWLEDGE SYSTEM (IKS)**  
**Syllabus for Faculty of Arts, Commerce & Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-III**

<b>Course Level</b>	5.0	<b>Internal Marks</b>	25
<b>Programme</b>	Arts, Commerce & Science	<b>External Marks</b>	25
<b>Semester</b>	3	<b>Practical Internal</b>	-
<b>Course Type</b>	Indian Knowledge System-2	<b>Practical External</b>	-
<b>Course Credit</b>	02	<b>Prac.Ext.Exam Time</b>	-
<b>Teaching Hours</b>	30	<b>Total</b>	50
<b>Course Code</b>		<b>Exam Duration</b>	1 Hour
<b>Course Title</b>	<b>Indian Mythology: Avatars</b>		

**Course Objectives:**

- To expose students to rich cultural knowledge of avatars
- To understand myth and message behind each avatar tale
- To understand concept of avatars in modern light
- To spread awareness on Indian knowledge system

**Course Learning Outcomes:** After completion of the course:

- Students will be able to understand the concept of avatar in Indian mythology.
- Students will be able to identify myths and message behind them.
- Students will be able to understand impact of myth on public life.
- Students will be able to evaluate Indian myths on avatars and their modern retelling.

**Course Contents**

<b>Sem</b>	<b>Unit No.</b>	<b>Syllabi</b>	<b>Teaching Hours</b>
3	1	<ul style="list-style-type: none"> <li>• Matsya avatar</li> <li>• Kurma avatar</li> <li>• Varah avatar</li> <li>• Narsimha avatar</li> <li>• Vamana avatar</li> </ul>	15
	2	<ul style="list-style-type: none"> <li>• Parashuram avatar</li> <li>• Rama avatar</li> <li>• Krishna avatar</li> <li>• Buddha avatar</li> <li>• Kalki avatar</li> </ul>	15

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**VALUE ADDED COURSE (VAC)**  
**INDIAN KNOWLEDGE SYSTEM (IKS)**  
**Syllabus for Faculty of Arts, Commerce & Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-III**

**Suggested Reading:**

1. Mythology of Vishnu and His Incarnations by M. L. Varadpande
2. Indian Mythology by Devdutt Pattanaik
3. Unusual Tales from Indian Mythology by Sudha Murty
4. Indian Mythology: Vedic and Puranic by William Wilkins

<b>INTERNAL EVALUATION SCHEME</b>		
<b>NO</b>	<b>Particulars</b>	<b>Marks</b>
1	<b>Mid Semester Exam (Mandatory)</b>	<b>13</b>
2	Class Test	03
3	Open book exam/test	03
4	Open note exam/test	03
5	Self-test/ Online test	03
6	Essay/Article writing	03
7	Quizzes/Objective test	03
8	Class assignment	03
9	Home assignment	03
10	Reports Writing	03
11	Research/Dissertation	03
12	Case Studies	03
13	Viva/Oral exam	03
14	Group Discussion	03
15	Role Play	03
16	Paper presentation/Seminar	03
17	Language Lab work	03
18	Interview	03
19	Craft work	03
20	Co-curricular work	03
21	Field Assignment	03
22	Poster Presentation	03
23	Attendance	03
24	Project Work	03
	<b>Total</b>	<b>25</b>

**Note: Sr.No.1 is mandatory. Select any Four from Sr.No.2 to 24. Each Contains three marks. Student should secure 09 Marks for passing in internal Exam.**

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY**  
**VALUE ADDED COURSE (VAC)**  
**INDIAN KNOWLEDGE SYSTEM (IKS)**  
**Syllabus for Faculty of Arts, Commerce & Science as per NEP**  
**Effective from June 2024**  
**SEMESTER-III**

**Paper Style**

<b>Ques. No.</b>	<b>Particulars</b>	<b>From which Unit</b>	<b>Marks</b>
<b>1</b>	Students will answer <u>two</u> questions from given four, each carrying 5 marks.	1	10
<b>2</b>	Students will answer <u>two</u> questions from given four, each carrying 5 marks.	2	10
<b>3</b>	Students will answer <u>5 MCQ/One liner</u> question from seven asked, each carrying 1 mark.	From each Unit  (3/4 from Unit-1 and 3/4 from Unit-2)	05
		Total Marks	<b>25</b>