



Faculty of Science

**Shree Ramkrishna Institute of Computer Education and
Applied Sciences, Surat**

B.Sc. Artificial Intelligence and Data Science

Bachelor of Artificial Intelligence and Data Science 2025-26

Introduction:

The B.Sc. in Artificial Intelligence and Data Science program invites students from many academic backgrounds who wish to pursue education and employment across the domains of artificial intelligence and data science. It will empower you to fulfil your academic potential as well as help you gain the industry-specific and interpersonal abilities you need to work as an IT professional.

Your studies will blend theoretical concepts with technical skills. It mixes Data Science with real-world data to enable machines and computers to mimic the human mind's decision-making and problem-solving capabilities. Many human mental activity, such as developing computer programs, completing arithmetic, engaging in common sense thinking, interpreting language, and even driving a car, are said to require "intelligence". AI systems are built, tested, and upgraded.

Data Science is a vast field that encompasses many aspects of statistics, mathematics, and information technology. A Data Science course syllabus for beginners covers the fundamentals and advanced ideas of data analytics, machine learning, statistics, and programming languages such as Python and R. It also teaches students how to use massive datasets to detect trends and build predictive models. Data science has gone a long way. Data scientists are the most critical asset for any organization hoping to prosper in this mad rush. They are now the "wizards of all problem solvers."

The course can cover a variety of interdisciplinary topics, including programming languages, algorithms, operating systems, databases, machine learning, data mining, artificial intelligence, big data, probability and statistics, data optimization, statistical simulation and data analysis, management decision analysis, decision models, and predictive analytics. Data science has become increasingly important in the field of computer science. The demand for scientists who understand data in all of its elements will continue to rise dramatically.

Artificial Intelligence and Data Science refers to the use of various tools and techniques from the disciplines of Artificial Intelligence & Data Science, applied statistics, mathematics, and computer science to gain greater insight and make better and more informed decisions for a variety of purposes by analyzing large amounts of data. As a result, the study of Artificial Intelligence and Data Science as a subject has become critical to fulfilling the growing demand for experts and researchers to deal with upcoming challenges.

Objectives of the programme:

- Provide students with a strong foundation in mathematics, statistics, computer science, and AI/data science principles to analyze, design, and develop intelligent systems and solutions.
- Encourage the capacity to use machine learning, deep learning, data mining, and big data analytics approaches to solve real-world problems in fields such as healthcare, finance, transportation, and social media, while also fostering innovation and research.
- Instill a thorough awareness of ethical considerations, data privacy, and responsible AI usage, while also educating graduates to work effectively in diverse teams, convey complex ideas clearly, and adapt to changing technologies and industry demands.

Eligibility Criteria:

- A candidate must have passed 10+2 in any stream with Mathematics / Physics / Electronics / Statistics / Business maths/Accountancy as one of the subjects or an equivalent examination.
- The candidate who has passed equivalent exam from other subjects or boards need to avail eligibility certificate for this programme from the Board of Equivalence (BoE) of the Sarvajanic University.

Credit Structure: (Annexure-1)

Semester wise course group wise credit allocation for Under Graduate Programme

Semester	Major						Minor		Skill Enhancement		Ability Enhancement		Multidiscipl.		Value Added		Total Credits
	Major No. of Papers	Theory		Lab		Total Major Credits											
		Theory Hours	Theory Credits	Lab Hrs	Lab Credits		No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits	No. of Papers	Credits	
1	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22
2	2	3+3	3+3	2+2	1+1	8	1	4	1	2	1	2	1	4	1	2	22
3	3	3+3+3	3+3+3	2+2+2	1+1+1	12	0	0	1	2	1	2	1	4	1	2	22
4	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	1	2	1	2			1	2	22
5	3	3+3+3	3+3+3	2+2+2	1+1+1	12	2	8	1	2							22
6	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	Intrnsp	4	1	2					22
Total after 3y	16					64	6	24	5+I	10+4	5	10	3	12	4	8	132
7 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22
8 (Honors)	4	3+3+3+3	3+3+3+3	2+2+2+2	1+1+1+1	16	1	4	1	2							22
7 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22
8 (Research)	3	3+3+3	3+3+3	2+2+2	1+1+1	12	1	4	RP	6							22
Total after 4y	24/22					96/88	8	32	7+I	18/26	5	10	3	12	4	8	176

SEMESTER- 1: Year 2025-26

		TITLE OF SUBJECT	CREDIT	TH (Hrs)	PR (Hrs)	TOTAL
SEMESTER -1	Major	Structured Programming Methodology (TH)	3	3	-	3
	Major	Structured Programming Methodology (PR)	1	-	2	1
	Major	Database Management Systems-I (TH)	3	3	-	3
	Major	Database Management Systems-I (PR)	1	-	2	1
	Minor	Fundamentals of Computer Systems	4	4	0	4
	SEC	Web Designing-I (TH)	1	1	-	1
	SEC	Web Designing-I (PR)	1	-	2	1
	MDC	Fundamentals of Mathematics and Statistics	4	4	0	4
	AEC	MIL Gujarati-I / Integrated Personality Development Course - I	2	2	0	2
	VAC	Indian Knowledge System (Foundation)	2	2	0	2
		total=	22			

Faculty of Science

**Shree Ramkrishna Institute of Computer Education and
Applied Sciences, Surat**

B.Sc. Artificial Intelligence and

Data Science

SEMESTER- 1

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS31101	Course Name	Structured Programming Methodology (TH)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
3	3	-	-	40	35	75

Purpose of Course	The aim of this course is to introduce to the students the rudiments of programming using java language. Students will become familiar with problem solving techniques and algorithm development.
Course Objective	- To gain knowledge about Programming languages, programming methodology. - To gain knowledge about basic Java language syntax and semantics to write programs and use concepts such as variables, conditional and iterative execution methods etc. - To understand how to work with Arrays and Strings.
Pre-requisite	NIL
Course Out come	At the end of the course, student is expected to have understanding about the concepts of programming languages, programming basics, Functions, Strings and Arrays, etc.
Course Content	Unit 1 Introduction to programming [6 hrs] 1.1 What is a program? 1.2 Levels of programming languages 1.3 Programming methodologies – structured and object-oriented 1.4 Java History 1.5 Features of Java, Bytecode, Steps of java program execution Unit 2 Introduction to program design [6 hrs] 2.1 What is a Flowchart? 2.2 Flowchart symbols and its usage 2.3 What is an Algorithm? 2.4 Characteristics of good algorithm Unit 3 Getting started with structured programming [6 hrs] 3.1 Basic structure of program in java 3.2 Variables, Datatypes, Keywords, Constants, Comments

	3.3 Printing output 3.4 String literal 3.5 Operators 3.5.1 Arithmetic Operators 3.5.2 Unary Operators 3.5.3 Relational Operators 3.5.4 Assignment Operators 3.5.5 Conditional Operators 3.6 Type casting Unit 4 Control structures [7 hrs] 4.1 Looping statements 4.1.1 while Loop 4.1.2 do-while Loop 4.1.3 for Loop 4.2 Various forms of if Statement 4.2.1 If, else if, nested if 4.2.2 Switch statement 4.2.3 Break and Continue Statements Unit 5 Introducing Functions [7 hrs] 5.1 Inbuilt functions 5.2 User defined functions 5.2.1 Function declaration, definition and function calling 5.2.2 Passing parameter to functions 5.2.3 Returning values from functions Unit 6 Strings and Arrays [8 hrs] 6.1 String class 6.2 Inbuilt String methods 6.3 Operations on String without using inbuilt functions 6.4 Concept of Substring 6.5 Creating and accessing an array, array literal 6.6 Single Dimensional array 6.7 Multi-Dimensional array 6.8 Operations on Arrays 6.9 Passing array to the function
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	1. The Complete Reference Java2 Herbert Schildt TMH, New Delhi 2. Mastering JAVA2 John Zukowski BPB 3. 3. Teach Yourself Java2 platform in 21 days Lamey & Cadenhead Teach Media 4. Java in Nut shell - O'Relly Publication 5. Java Language Reference - O'Relly Publication

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS31104	Course Name	Structured Programming Methodology (PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
1	-	-	2	10	15	25

Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods, tools and techniques studied in courses of semester 1.
Course Objective	The objective of these course is to enable students to learn practical implementation of Structured Programming Methodology
Pre-requisite	As per theory papers of Major - Structured Programming Methodology
Course Out come	After completion of this course, the student will be capable of performing practical application of subject - Structured Programming Methodology
Course Content	The students will be required to carry out practical on Structured Programming Methodology using the methods and tools discussed there in. A Journal must be prepared for the practical work done.
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	As per paper Major - Structured Programming Methodology

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS31103	Course Name	Database Management Systems-I (TH)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
3	3	-	-	40	35	75

Purpose of Course	This course covers database management systems, entity relationship models, relational models, and SQL (DDL, DML, and DCL).
Course Objective	To introduce the concept of database systems, modeling of data and to make use of SQL for efficient storage and retrieval of data.
Prerequisite	NIL
Course Out come	Students will be able to: · Recognize the differences between traditional file processing systems and database approaches; · Create an entity-relationship model according to user needs; Data from one or more tables can be stored, modified, and retrieved using SQL statements.
Course Content	Unit 1 Introduction to DBMS [7 hrs] 1.1 Fundamental concepts - data, information, database, DBMS, table, row, field 1.2 Need of Information - Business, Research, Governance 1.3 Requirement of DBMS 1.4 Levels of Abstraction in DBMS 1.5 Database Users and Administrator Unit 2 Database Architecture and models [7 hrs] 2.1 Database Architecture - Centralized database, Client-server, Parallel database, Distributed database 2.2 Introduction to data models - Relational, E-R, Object-Oriented Unit 3 Relational Database Design [7 hrs] 3.1 Structure of relational database. 3.2 Keys - Super key, candidate key, Primary key 3.3 E.F. Codd's rule

	3.4 Functional Dependency 3.5 Anomalies of DBMS 3.6 Normal Forms: 1NF, 2NF, 3NF, BCNF Unit 4 Entity Relationship Model [7 hrs] 4.1 Basic concepts and symbols used in E-R notation 4.2 Mapping cardinalities 4.3 Types of attributes 4.4 Generalization, Specialization 4.5 Designing E-R diagram Unit 5 DDL Statements and Indexing [9 hrs] 5.1 Data Types of attributes 5.2 Schema-based operations: Table Creation, Table structure modifications and removal 5.3 Domain Constraints 5.4 Referential Integrity Constraints 5.5 Create, Alter and Drop Index Unit 6 DML Statements [8 hrs] 6.1 Data manipulation 6.2 Retrieving the data 6.3 Operators: IN, BETWEEN, LIKE, Relational, Arithmetic and Logical Operators
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	1. Silberschatz, Korth, Sudarshan ,Database System Concepts, McGraw-Hill computer science series 2. C J Date, An introduction to Database Systems, Addison-Wesley 3. Nilesch shah, Database System using Oracle, PHI. 4. Ramez Elmasri & Shamkant B. Navathe, Fundamentals of Database Systems, Addison-Wesley 5. Hector Gracia-Molina, Jeffrey D. Ullman, and Jennifer Widom, Database System Implementation, Pearson. 6. Ivan Bayross, SQL, PL/SQL, BPB Publications 7. Scott Urman, Oracle9i PL/SQL programming, McGraw-Hill

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS31105	Course Name	Database Management Systems-I (PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CA)	Term end examinations (TEE)	Total
1	-	-	2	10	15	25

Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods, tools and techniques studied in courses of semester 1.
Course Objective	The objective of these course is to enable students to learn practical implementation of Database Management Systems
Pre-requisite	As per theory papers of Major - Database Management Systems-I
Course Out come	After completion of this course, the student will be capable of performing practical application of subject - Database Management Systems-I
Course Content	The students will be required to carry out practical on Structured Programming Methodology using the methods and tools discussed there in. A Journal must be prepared for the practical work done.
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	As per paper Major - Database Management Systems-I

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS32103	Course Name	Fundamentals of Computer Systems			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
4	4	-	-	50	50	100

Purpose of Course	The purpose of course is to make students aware of the basic concept of computer architecture and fundamentals regarding software development process.
Course Objective	To provide fundamental knowledge of computer ,hardware technologies, operating system and its process, basic of internet and software.
Pre-requisite	Basic understanding of computers.
Course Out come	After completion of this course, the student will get knowledge of computer internal structure, memories, various operating systems and basic idea for software development processes.
Course Content	Unit 1 Computer Organization [8 hrs] 1.1 Personal Computer, Workstation, Server, Mainframe, Super Computer, Embedded System 1.2 Basic building blocks – CPU, interconnection Bus, Input-Output 1.3 Internal architecture of processor – Register, ALU, Control Unit, Program Counter, Stack Pointer 1.4 Inter connection Bus structure – Data Bus, Address Bus, Control Bus 1.5 Processor Operations – Instruction cycle, Instruction fetch, Instruction decode, instruction execute, Program flow control, Processor clock, Machine cycle and T-state, interrupts and interrupt service routine Unit 2 Basics of Operating System [7 hrs] 2.1.Basic concept of Operating System 2.2.Purpose of Operating System 2.3.Types of Operating System Unit 3 Memory Management [9 hrs] 3.1.Types of Memory 3.2.Processor - Memory interaction 3.3.Secondary Memory, Direct Memory Access (DMA) 3.4. I/O Device controllers, I/O Processors

	3.5.Virtual Memory 3.6.Overview of Memory management – addressing, allocation, garbage collection, free memory list, paging, segmentation 3.7.Booleam algebra 3.8.Number System - Conversion of Numbers, Binary addition & subtraction, ASCII and ANSI character code Unit 4 Fundamentals of Computer Networking [6 hrs] 4.1 Need for Computer Networking 4.2 Types of Networks – LAN, MAN, WAN, Internet, Intranet 4.3 Applications of Network Unit 5 Fundamentals of Internet [7 hrs] 5.1 Overview of Internet, Intranet and types 5.2 World Wide Web (WWW), 5.3 Website Basics - WebPages(static and dynamic); HyperText, Web browser, Web Servers; Web Hosting, Web Portal, Domain name server 5.4 Overview of Client & Server Side Scripting, Applications of Internet Unit 6 Software Basics [8 hrs] 6.1 Types of Software 6.2 Software development life cycle 6.3 Software engineering practice – communication, planning, modelling, constructions, deployment 6.4 Software application architectures – Desktop applications, client-server/Web application, cloud application Unit 7 Software Engineering [8 hrs] 7.1 Various roles in software engineering 7.2 Software quality attributes – FURPS 7.3 Various programming methodologies – Structured, object oriented, event driven, pair programming, extreme programming 7.4 Coding standards and guidelines Unit 8 Advance Processing System [7 hrs] 8.1 Parallel Processing with Uniprocessor 8.2 Pipeline computers, Array computers, Multiprocessor system 8.3 Overview of SIMD, MIMD
Reference Books	1. Computer Architecture: K M Hebbar 2. Computer System Architecture: M. Morris Mano 3. Introduction to computers: 4th Edition – Peter Norton 4. Fundamentals of Computers: V. Rajaraman 5. Computer Architecture and Organization- A Journey Through Evolution: P. Chakraborty 6. Computer Architecture and Organization: Subrata Ghosal

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS35103	Course Name	Web Designing-I (TH)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
1	1	-	-	12	13	25

Purpose of Course	The course gives students an idea about client server architecture and how to design basic web page design and to make students capable of developing effective and interactive web client parts of web applications.
Course Objective	To provide fundamental knowledge of Web page design with HTML5, CSS, Javascript.
Pr-requisite	NIL
Course Outcome	After completion of this subject, student will be able to • The student will be capable of designing effective and interactive web pages using HTML5, CSS, Javascript. • Design front web designing.
Course Description:	It is a Web application development platform for designing effective and interactive web applications.
Course Content	Unit 1 Web designing Fundamentals [7 hrs] 1.1 Overview of Client & Server architecture 1.2 Website Basics - WebPages(static and dynamic) 1.3 Web browser, Web Servers; Web hosting, Web Portal, Domain name server Unit 2 Basic Web page designing with HTML 5 [8 hrs] 2.1 HTML Structure 2.2 Basic HTML Tags – Formatting, Table, Headings 2.3 Other Tags – Ordered Lists, Unordered Lists, Links 2.4 Tables and Frame, Form Tags 2.5 HTML 5- standard and custom attributes, events 2.6 Web Form 2.0, Web storage, Web SQL 2.7 SVG, Canvas, Embedding and Playing Audio & Video

	Unit 3 Cascade Style Sheets [7 hrs] 3.1 Introduction to CSS and Its types 3.2 Common Tasks with CSS-styling fonts, margins, links With Background related tags, Border related tags, Font related tags, Margin related tags, Text related tags, Page related tags, List related tags, Colour tag, Layer tag, Size and location related properties. 3.3 Assigning classes Unit 4 JavaScript [8 hrs] 4.1 Structure of JavaScript 4.2 Data Types and Variables in JavaScript 4.3 Operators : Arithmetic Operator, Assignment Operator, Comparison Operator, Logical Operator, Conditional Operator in JavaScript 4.4 Control Structure : If...Else, While, Do...While, For and Functions in JavaScript 4.5 Handling events in JavaScript-Windows event, Event object
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	1. HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery, Dreamtech Press 2. WEB TECHNOLOGIES: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML AND AJAX, BLACK BOOK: HTML, Javascript, PHP, Java, Jsp, XML and Ajax, Black Book, Dreamtech Press 3. HTML5 and CSS3 made Simple, Ivan Byross, BPB 4. Pro HTML5 and CSS3 Design Patterns, Dionysios Synodinos, Michael Bowers and Victor Sumner, Pearson 5. HTML5 In easy steps, Mike McGrath, McGrawHill 6. Programming in HTML5 with JavaScript and CSS3 Training Guide, Johnson G, PHI 7. JavaScript in easy Steps, Mike McGrath, McGrawHill.

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Faculty	Science		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2025		Version	1.0		
Semester	I		Effective From	April, 2025		
Course Code	BSCS35104	Course Name	Web Designing-I (PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
1	-	-	2	13	12	25

Purpose of Course	The purpose of the course is to make students capable of implementing concepts, methods, tools and techniques studied in courses of semester 1.
Course Objective	The objective of these course is to enable students to learn practical implementation of Web Designing
Pre-requisite	As per theory papers of SEC - Database Management Systems-I
Course Out come	After completion of this course, the student will be capable of performing practical application of subject - Web Designing-I
Course Content	The students will be required to carry out practical on Web Designing-I using the methods and tools discussed there in. A Journal must be prepared for the practical work done.
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	As per paper SEC -Web Designing-I

Fundamentals of Mathematics and Statistics

Course Code	
Course Title	Fundamentals of Mathematics and Statistics
Credit	4
Teaching per Week	4 Hours
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	--
Purpose of Course	Awareness about mathematics functionality and statistics
Course Objective	• Basic concepts of set and functions of mathematics • Concepts of matrices and probability theory • Classification of data and correlations
Pre-requisite	Nil
Course Outcome	Students will able to understand the importance of mathematics with different functionality and usage of mathematics in computer system concepts.
Course Content	Unit 1. Concept of Set Theory [9 hrs] 1.1 Notations 1.2 Inclusion and equality of Sets 1.3 The power Set 1.4 Operations on Set 1.5 Venn Diagrams 1.6 Ordered Pair and n-tuples 1.7 Cartesian Product 1.8 Algebraic Laws of Set Theory, Set identities 1.9 Relations, Domain and Range of Relations, Properties of Relations 1.10 Intersection, Union and Difference of Relations Unit 2. Functions [9 hrs] 2.1 Definitions – Function, Domain and Co-domain, Range 2.2 Types of function –One –One function, Onto Function, One – One Onto function 2.3 Equal Functions, Some Basic Functions –Constant function, Identity Function, Modulus Function, Signum Function, Greatest Integer Function, Even –Odd functions, Linear Functions, Quadratic Functions 2.4 Classification of Functions (Introduction only) –Algebraic Functions, Transdental Functions, Rational Functions,

	Trigonometric Functions, Exponential Functions, Natural and General Logarithmic Functions, Power Functions, Inverse Functions
	Unit 3. Mathematical Logic [7 hrs] 3.1 Statements and Notations 3.2 Connectives 3.2.1 Negation 3.2.2 Conjunction 3.2.3 Disjunction & Exclusive disjunction 3.2.4 Truth Tables 3.2.5 Properties of logical connectives 3.2.6 Well –formed Formulas 3.3 Normal Forms 3.3.1 Disjunctive Normal Forms 3.3.2 Conjunctive Normal Forms 3.3.3 Principle Disjunctive and Conjunctive Normal Forms
	Unit 4. Introduction to Matrices [8 hrs] 4.1 Introduction of Matrices and determinant 4.2 Different types of Matrices 4.3 Properties of Matrices 4.4 Operations on Matrices 4.5 Concept of Adjoint of as Matrix and Inverse of a Matrix 4.6 Rank of a Matrix
	Unit 5. Classification and Tabulation of Data [6 hrs] 5.1 Classification of Data 5.2 Presentation of Statistical Data 5.2.1 Textual Presentation 5.2.2 Tabular Presentation 5.2.3 Graphical Presentation 5.2 Accuracy and Precision 5.4 Values of a variable and Frequency 5.5 Grouped Frequency Distribution 5.6 Cumulative Frequency Distribution
	Unit:6 Measurements of Central Tendency and dispersion [9 hrs] 6.1 Measurements of Central Tendency 6.1.1 Mean, Arithmetic Mean and Weighted Arithmetic Mean, their properties 6.1.2 Median, Mode and their computations 6.1.3 The empirical Relation between The Mean, Median and Mod 6.1.4 The Root Mean Square

	6.2 Measure of Dispersion 6.2.1 Dispersion of Variation, The Range 6.2.2 The Mean Deviation, The Standard Deviation, The variance, their properties Unit 7. Elementary Probability Theory [6 hrs] 7.1 Definitions of Probability, Conditional Probability 7.2 Independent and Dependent Events, Mutually Exclusive Events 7.3 Probability Distributions –Discrete and Continuous 7.4 Axioms of Probability Theory Unit 8. Elementary Correlation Theory [6 hrs] 8.1 Correlation, correlation analysis, uses of correlation 8.2 Regression, Regression Analysis, Uses of Regression 8.3 Linear Correlation, Scatter Diagram method of correlation measurement. 8.4 Standard Error of Estimate
Reference Books	1. Shantinayaran: Text book of Matrices, S. Chand and Co., New Delhi 2. Krishnamurthy, Mainra and Arora: An Introduction to linear Algebra, Affiliated West Press, Pvt. Ltd., New Delhi 3. S. L. Loney: Plane Trigonometry, Part I and II, Mc Millan and Co. London. 4. R. S. Verma, K. S. Shukla: Text book of Trigonometry, Pothishala Pvt. Ltd. Allahabad.
Teaching Methodology	The course is composed of Lectures, assignments and a group project.
Evaluation Method	50% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 50% assessment is based on end semester written examination

Name of Faculty: Science	Department: Allied (English)
Program: UG	Type: AEC – Sem- 1
Subject: Integrated Personality Development Course -1	

Credit: 02	Total Learning Hours: 30 Hours
Course Description: • The aim of this course is to deliver knowledge of Values and Morals in life • It also aims at walking the path to self-progress, peace and contentment in life.	
Student Learning Outcome: After completion of the course the student will be able to • Use a number of life skills to achieve professional success • Contemplate and imbibe valuable lessons to strengthen themselves as better human being	

Unit -1

Remaking Yourself - Restructuring yourself, Power of Habits, Handling social media

Learning from legends – Tendulkar and Tata

Unit -2

From House to Home – Listening and Understanding, Bonding the Family

Facing failure – Welcoming Challenges, Significance of Failures, Power of Faith

Unit -3

My India my Pride – Glorious Past -1& 2

Learning From Legends – A. P. J. Abdul Kalam

Unit - 4

Soft Skills- Networking & Leadership, Project Management

Selfless Service - Seva

Recommended Reading:

1. English and Soft Skills, S.P.Dhanavel, Orient BlackSwan Publishing, 2010.
2. English and Soft Skills, Vol – 2, S.P.Dhanavel, Orient BlackSwan Publishing, 2019.
3. Integrated Personality Development Course -1 - Workbook – 1

Sarvajanik University
Faculty of Science
B.Sc. (Hons)

Faculty: Science	Department: All
Program: B. Sc. (Hons)	Type: Ability Enhancement Course
Subject: MIL Gujarati-1	Credits: 2
Semester: 1	

Unit 1: ગુજરાતી સાહિત્ય

- ગુજરાતી સાહિત્યનો ઇતિહાસ
- ગુજરાતી સાહિત્યના નોંધપાત્ર લેખકો અને કવિઓનો પરિચય

Unit 2: ગુજરાતી વ્યાકરણ

- રૂઢીપ્રયોગોના અર્થ અને તેનો વાક્યપ્રયોગ
- કહેવતોનો અર્થ
- સમાસનો વિગ્રહ કરી તેની ઓળખ
- છંદ ઓળખાવો
- અલંકાર ઓળખાવો

Unit 3: ગુજરાતી વ્યાકરણ

- શબ્દસમૂહ માટે એક શબ્દ
- જોડણી શુદ્ધિ
- લેખન શુદ્ધિ / ભાષા શુદ્ધિ
- સંધિ જોડો કે છોડો
- વાક્યરચનાના અંગો / વાક્યના પ્રકાર / વાક્ય પરિવર્તન

Unit 4: સંક્ષેપીકરણ અને સમીક્ષા

- ગદ્યખંડમાંથી આશરે ૧/૩ ભાગમાં સંક્ષેપ
- ગદ્યખંડના આધારે પૂછેલા પ્રશ્નોના જવાબ

Sarvajanik University

Faculty of Science

B.Sc. (Hons)

Faculty: Science	Department: All
Program: B.Sc. (Hons)	Type: Value Added Course (VAC)
Subject: Indian Knowledge System (Foundation)	Credits: 2
Semester: 1	

Unit 1: Foundational Literature of Indian Civilisation

(08 hours)

- The Vedic Corpus
- Caturdaśa vidyāsthāna-s: 14 branches of learning in ancient India- purāṇa, nyāya, mīmāṃsā, dharmaśāstra, six vedāṅga-s: (śikṣā, vyākaraṇa, nirukta, chanda, jyotiṣa, kalpa) and four Veda-s- rgveda, yajurveda, sāmaveda and atharvaveda; introductory information on them
- Upaveda-s and Upaniṣads: introductory information on them
- śāstra-s and some introductory information on them
- 18 purāṇa-s: Their names and five general characteristics
- The Itihasas: Ramayana and Mahabharata (Learnings from them in brief)

Unit 2: Indian Philosophical System

(07 hours)

- Four Purusartha: Dharma, artha, kama and moksha (Definitions and Meaning)
- Astika and Nastika Darshan
- Tarkashastra
- Hetu-lakṣaṇa and hetvabhāsa lakṣaṇa (Cause and Fallacies)
- Pañca adhikaraṇa System- viśaya, saṁśaya, pūrvapakṣa, uttarapakṣa and saṁgati
- The purpose of knowledge: Para Vidya and Apra Vidya

Unit 3: Indian Mathematics and Astronomy

(08 hours)

- Important texts on Indian Mathematics
- Development of numbers, fractions, decimals, algebra, trigonometry and calculus
- Further continuity of Indian Mathematics: Kerala school and Ramanujan, their influence
- Important texts on Indian Astronomy
- Observations and records on the movement of celestial bodies, equinoxes, solstices, eclipses
- Planetary model of Aryabhata and its revision by Nilkantha
- Further continuity of Indian astronomy by Jaisingh, Sankaravarman, Chandrasekhara Samanta.

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B.Sc. (Hons)

Unit 4: Indian Sciences

(07 hours)

- Important Texts of Ayurveda
- Basic concepts of Ayurveda
- Surgical practices, inoculation, current revival of Ayurveda and Yoga
- Indian agriculture as mentioned by the Greek historians and later travelers
- The Ery system of south India
- Indian attitude towards agriculture based on Walker
- Indian texts which refer to metallurgy
- Mining and manufacture in India of Zinc, Iron, Copper, Gold, etc., from ancient times

References:

1. Sivananda S. All about hinduism. Sivananda literature research institute; 1988.
2. Dharampal G. Essential Writings of Dharampal. Publications Division Ministry of Information & Broadcasting; 2017 Nov 3.
3. Bajaj J, Śrīnivāsa MD. Sanatana Bharat, jagrita Bharat= Timeless India, resurgent India: a celebration of the land and people of India. (No Title).