SRKI
Bachelor of Science in Information Technology
Bachelor of Science in Information Technology Honors

SARVAJANIK
UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

Faculty of Science

Shree Ramkrishna Institute of Computer Education & Applied Sciences, Surat

B. Sc. (Information Technology) and B. Sc. (Information Technology Honors)

With Effect From 2024

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Bachelor of Science Information Technology 2024-25

Introduction:

The B.Sc. in Information Technology program welcomes students from a variety of academic backgrounds having interest in pursuing study and career in the field of Information Technology. It will empower you to fulfil your academic potential and help you gain the industry-specific and interpersonal skills you need to work as an IT professional.

Your studies will combine theoretical principles with technical skills. The student will learn how Information and Communications Technology (ICT) systems are developed, made live and managed. In addition, you will gain a practical understanding of the latest professional and ethical issues in the field.

The subject includes software development as well as its operations, support and systems administration. It features a wide variety carefully designed courses that are based on web and mobile systems and technologies, database systems, computer communication and networks, network security, software engineering and software testing, system architecture, information systems, and human computer interaction, embedded systems and IOT.

The B.Sc. in Information Technology program prepares students to meet the information and communication technology needs of government, business, healthcare, universities, and other kinds of organizations.

Objectives of the programme:
Main objective of the program is to impart knowledge of fundamentals, latest theories, concepts, methods, techniques and tools related to various areas of computer applications and information technology and specifically in the area of mobile based, cloud based, web based application development, software engineering, data management.

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 Sarvajanik University.

Credit Structure: (Annexture-1)

Semester wise course group wise credit allocation for Under Graduate Programme

Semester	Major no. of Papers	Theory Hours	Theory Credits	Lab Hrs	Lab credit	Total Major Credits	Minor No. of Papers	Minor Credits	Skill Enhancement No. of Papers	Skill Enhancement Credits	Ability Enhancement No. of Papers	Ability Enhancement Credits	Multidisciplinary No. of Papers	Multidisciplinary Credits	Value Added No. of Papers	Value Added Credits	Total 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

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6	3	3 + 3 + 3	3 + 3 + 3	2 + 2 + 2	1 + 1 + 1	12	1	4	Internship	4	1	2					22
Total (After 3yrs)	**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 4yrs)	**24/22**					**96/88**	**8**	**32**	**7+I**	**18/26**	**5**	**10**	**3**	**12**	**4**	**8**	**176**

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Evaluation Scheme for Semester 1 and 2:

Semester	Subject group	Continuous Comprehensive Evaluation				Semester End Examination (SEE)	Grand Total
		CE	Attend.	Assign.	Total CEE		
1	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	SEC	15	05	05	25	25	50
	Multidisciplinary	10	10	30	50	50	100
	Ability Enhancement Course	15	05	05	25	25	50
	Value Added Course	15	05	05	25	25	50
				Total	**275**	**275**	**550**
2	Major	30	10	10	50	50	100
	Major	30	10	10	50	50	100
	Minor	30	10	10	50	50	100
	SEC	15	05	05	25	25	50
	Multidisciplinary	10	10	30	50	50	100
	Ability Enhancement Course	15	05	05	25	25	50
	Value Added Course	15	05	05	25	25	50
Total					**275**	**275**	**550**

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B.Sc. Information

Technology SEMESTER- 1

Structured Programming Methodology

Course Code	
Course Title	**Major : Structured Programming Methodology**
Credit	3 (Theory) + 1 (Practical)
Teaching per Week	3hrs (Theory) + 2hrs (Practical)
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	---
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 Java 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 **[6 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 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

Text and Reference Literature	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
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment, Internal Project Development Practical Assignments 80% (Approximately weekly)
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

Database Management System-I

Course Code	
Course Title	**Major: Database Management Systems-I**
Credit	3 (Theory) + 1 (Practical)
Teaching per Week	3hrs (Theory) + 2hrs (Practical)
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
Purpose of Course	This course imparts the knowledge of Database Management system, Entity Relationship model, Relationship Model, 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 · Differentiate between database approach and conventional file processing system · Understand concepts of database · Design an entity-relationship model based on user requirements · Use SQL statements to store, modify and retrieve data from one or more Tables

Course Content	Unit 1 Introduction to DBMS [6 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 [5 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
	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 Keys - Super key, candidate key, Primary key
	4.5 Generalization, Specialization
	4.6 Designing E-R diagram
	Unit 5 DDL Statements and Indexing [7 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
Text and Reference Literature	1. Silberschatz, Korth, Sudarshan ,Database System Concepts, McGraw-Hill computer science series 2. C J Date, An introduction to Database Systems, Addition-Wesley 3. Nilesh 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
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment, Internal Project Development Practical Assignments 80% (Approximately weekly)
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

Fundamentals of Computer Systems

Course Code	
Course Title	Minor: Fundamentals of Computer Systems
Credit	4(Theory)
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
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 and its process, basic Web page design
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 Organisation** **[7 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** **[3 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.Boolean algebra 3.8.Number System - Conversion of Numbers, Binary addition & subtraction, ASCII and ANSI character code

	Unit 4 Fundamentals of Computer Networking **[4 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 **[6 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 **[5 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 **[4 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 **[4 hrs]**
	  8.1 Parallel Processing with Uniprocessor
	  8.2 Pipeline computers, Array computers, Multiprocessor system
	  8.3 Overview of SIMD, MIMD

Reference Book	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
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
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

WEB DESIGNING - I

Course Code	
Course Title	**SEC- 1: Web Designing-I**
Credit	1 (Theory) + 1 (Practical)
Teaching per Week	1 hrs (Theory) + 2 hrs (Practical)
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	-
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	-
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** [8 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 [8 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

Text and Reference Literature	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.
Practical	List of practical will be prepared at the beginning of each semester
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment, Internal Project Development Practical Assignments 80% (Approximately weekly)
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