



SRKI

Bachelor of Science in Computer Science
Bachelor of Science in Computer Science Honors



SARVAJANIK
UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

Faculty of Science

Shree Ramkrishna Institute of Computer
Education & Applied Sciences, Surat

B. Sc. (Computer Science)
and
B. Sc. (Computer Science Honors)
With Effect From 2024

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Evaluation Scheme for Semester 3 and 4:

Semester	Subject group	Continuous comprehensive Evaluation				Semester End Examination (SEE)	Grand Total
		CE	Attend.	Assign.	Total CEE		
3	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
4	Major	30	10	10	50	50	100
	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
	Ability Enhancement Course	15	05	05	25	25	50
	Value Added Course	15	05	05	25	25	50
Total					275	275	550

Faculty of Science

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

B.Sc. (Computer Science)

SEMESTER- 3

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Web Application Development-I (PHP)

Course Code	
Course Title	Major: Web Application Development-I (PHP)
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	2021-22
Purpose of Course	The purpose of the course is to make students capable of developing professional applications using the latest tools and technologies in PHP.
Course Objective	For Students: - To Provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP - Will learn how to use MYSQL database
Pre-requisite	- HTML/XHTML, CSS, JS or equivalent knowledge - Other web programming languages knowledge will be helpful. - Knowledge of Database & basic SQL is recommended.
Course Outcome	Students will be able to - Carry out Server-side programming using PHP - Develop database-driven web applications - Integrating PHP programs with Client-side scripting
Course Content	Unit 1: Basic Introduction to PHP [8 Hrs] 1.1 Important tools and software requirements (like Web Server, Database, Editor s etc.) 1.2 Basic Syntax, PHP variables and constants Types of data in PHP, Expressions, scopes of a variable (local, global) 1.3 PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operators. PHP operator Precedence and associativity 1.4 PHP IF Else conditional statements (Nested IF and Else) 1.5 Switch Case, While, For and Do ... While Loop statements 1.6 Goto, Break, Continue and exit PHP Functions Unit 2: Arrays in PHP [7 Hrs] 2.1 Introduction to Array, creating index based and Associative array 2.2 Accessing array Looping with Index based array, with associative Array using each() and foreach(). 2.3 Some Useful array functions: implode, explode, count, different sorting functions, array_reverse, array_search, array_push, array_pop, array_keys, Key, sizeof. Unit 3: String Manipulation and Regular Expression in PHP [6 Hrs] 3.1 Creating and accessing String 3.2 Searching & Replacing String formatting, joining and splitting String Related Library functions 3.3 Use of preg_match(), preg_replace(), preg_split() functions in Regular Expression for validations.

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	Unit 4: Handling HTML forms with PHP and Database: [8 Hrs] 4.1 Capturing Form Data using GET and POST form methods 4.1.1 Dealing with multiple values including arrays to redirect data on another page. 4.1.2 Image / file upload implementation with PHP. 4.2 Dealing with Sessions & Cookies while handling forms (with Database) 4.3 Introduction to MySQLi and its data types. 4.3.1 Creating database, tables, relationships in database. 4.3.2 Storing images/files in the database. 4.4 MySQLi various supported database engines. Unit 5: Crud operation using OOP with PHP [8 Hrs] 5.1 Introduction to database connection functions. 5.2 Various database queries functions: mysqli_query, mysqli_fetch_array / row / object, mysqli_num_rows, mysqli_close, mysqli_select_db, mysqli_debug 5.3 Implementing CRUD operations with OOP concept. 5.4 Error Handling using 'try' and 'catch' Unit 6: Introduction to Ajax with PHP, Payment Gateway & Website Performance Evaluation [8 Hrs] 6.1 Use of Ajax, it's pros and cons 6.1.1 Basic function of AJAX with PHP 6.1.2 Implementation of AJAX with PHP (with database) 6.2 Payment Gateway Standard 6.3 Page Speed and performance related factors
Practical	List of practical will be prepared at the beginning of each semester
Text and Reference Literature	1. Core PHP Programming; Leon Atkinson; Pearson publishers 2. The Complete Reference PHP; Stever Holzner; McGraw Hill 3. Beginning PHP 5.0 Database; Christopher Scollo, Harish Rawat, Deepak Thomas; Wrox Press 4. PHP – A beginner; Ashok Appu; Wiley 5. PHP 5.0 and MySql Bible; Tim Converse, Joyce Park, Clark Morgan John; Wiley & Sons 6. MySQL Bible; Steve Suehring John; Wiley & Sons 7. PHP Black Book; Peter Moulding 8. PHP 5 and Mysql; Tim converse, Joyce Park and Clark Morgan; Bible Wiley 9. Beginning PHP 5.3; Matt Doyle; Wrox Publication
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment 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



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Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Computer Science		
Year	2025		Version	1.0		
Semester	III		Effective From	April, 2025		
Course Code	BSCS31310	Course Name	Python Programming- 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	The purpose of the course is to make students capable of implementing concepts, methods and tools related to python programming and basic data science operations.
Course Objective	This subject aims to cover the python language programming with emphasis on various python data structures and various libraries like Pandas, NumPy, Matplotlib for performing various data science operations.
Pre-requisite	Basic concepts of Programming
Course Outcome	After completion of this course, the student will be capable of performing application level programming using python language with basic data science operations.
Course Content	Unit 1 Introduction to Python [5 hrs] 1.1 Python History and Usability 1.1.1 Application areas of Python 1.1.2 Technical Strengths of Python 1.2 Program Execution in Python - Program Execution, Python Virtual Machine (PVM) 1.3 IDLE of Python, Jupyter Notebook Unit 2 Python Programming Basics [5 hrs] 2.1 Comments, Indentations, Operators 2.2 Assignment, Expressions and Data Types 2.3 Selection Control 2.4 Iterative Control Unit 3 Python Object Types and Operations [6 hrs] 3.1 String : Indexing, Slicing, Text Parsing 3.2 List : Indexing, Slicing and Merging List 3.3 Tuples and Sets Unit 4 Python Dictionaries [6 hrs] 4.1 Structure of Dictionaries

	4.2 Create, Access, Update, Remove Elements 4.3 Dictionary Methods 4.4 Nested Dictionary and Operations on Data Unit 5 Python Functions & Modules [6 hrs] 5.1 Function Basics 5.1.1 Definition, Call, Passing Arguments 5.1.2 Lambda Functions 5.2 Function Parameter and Call 5.2.1 Calling value returning function 5.2.2 Calling non-value returning function 5.2.3 Parameter Passing 5.2.4 Function arguments and variable scope 5.3 Modules 5.3.1 Modules and Name-spaces 5.3.2 Modules import, Load and execution 5.3.3 Top-Down Design 5.3.4 Built-in name-spaces in python Unit 6 Files Handling with Python [5 Hrs] 6.1 Opening, Reading and Writing Text file in python 6.2 File traversal 6.3 String and Text operations 6.4 Reading CSV, XML, JSON files
Practical	List of practical will be prepared at the beginning of each semester
Reference Books	1. Learning Python -Mark Lutz : O'Reilly Media 2. Core Python Programming – by Wesley J Chun ISBN-13: 978-0132269933 3. Introduction to Computer Science using Python - A computational problem solving focus - Charles Dierbach, Wiley ISBN-13 978-8126556014 4. Python for Everybody: Exploring Data in Python 3, by Charles Severance (Author), Aimee Andrion (Illustrator), Elliott Hauser (Editor), Sue Blumenberg (Editor) 5. An Introduction to Python - by van Rossum Guido ISBN: 9780954161767, 0954161769 6. Core Python Application Programming – by Wesley J Chun Prentice Hall

Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Science		Program	B.Sc. Information Technology		
Year	2025		Version	1.0		
Semester	III		Effective From	April, 2025		
Course Code	BSCS31311	Course Name	Python Programming- I(PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous Assessments (CCE)	Semester end examinations (SEE)	Total
1	–	-	1	15	10	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 3
Course Objective	The objective of these course is to enable students to learn practical implementation of Python Programming
Pre-requisite	As per theory papers of Major - Python Programming
Course Out come	After completion of this course, the student will be capable of performing practical application of subject - Python Programming
Course Content	The students will be required to carry out practical on Python Programming using the methods and tools discussed 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 - Python Programming

System Analysis, Modelling, Design and Management

Course Code	
Course Title	Major: System Analysis, Modelling, Design and Management
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	2021-22
Purpose of Course	The purpose of the course is to make students understand software engineering process and capable of applying the principles and techniques of computer science and engineering, to the analysis, design, development, testing, and evaluation of the software and the systems.
Course Objective	- To make students understand how to develop software. - To make students understand various components of software process model and their working. - To make students understand the importance of requirement analysis. - To make students understand various approaches of system design.
Pre-requisite	Basic knowledge of Computer Programming and Application Development
Course Out come	After completion of this course, the student will be capable of understanding software development principles, processes to develop and design software systems.
Course Content	Unit 1: Introduction to Software Engineering [6 Hrs] 1.1 Software, Software characteristics, Software Engineering 1.2 Software engineering approach 1.2.1 Introduction to phased development approach 1.2.2 Introduction to effort distribution 1.3 Software process models - Linear sequential / waterfall model, Prototype model, RAD model, Incremental model, Spiral model. 1.4 Various roles and responsibilities in SDLC 1.5 Software quality Assurance Unit 2: Agile Development [4 Hrs] 2.1 Agility and Agile Process 2.2 Agility principles 2.3 A Tool set for the Agile Process 2.4 Agile Development Models - Scrum and sprint Unit 3: Software Requirement Analysis & Modelling [8 Hrs] 3.1 Requirement gathering - formal & informal techniques 3.2 Requirement modelling 3.2.1 Use case modelling 3.2.2 Classification- Classes, Object relationships, attributes and Methods. 3.2.3 Data Flow Diagram 3.3 Class Based Methods 3.3.1 Class Notation-Static Structure 3.3.2 Object Diagram



	3.4 Software Requirement Specification Unit 4: Software Designing [8 Hrs] 4.1 Introduction to Design - Importance of design, Relationship between analysis & design, Design Principles 4.2 Design Concepts 4.2.1 System level design concepts – Abstraction, Refinement, Modularity, Information hiding, Polymorphism and reusability 4.2.2 Module level design concepts – Coupling, Cohesion 4.2.3 Overview of Designing software architecture 4.2.4 Concept of UI / UX Design Unit 5: Design Modelling [8 Hrs] 5.1 Sequence Diagram - Elements and Guidelines 5.2 Collaboration Diagram - Elements and Guidelines 5.3 Activity Diagram - Elements and Guidelines 5.4 State Chart Diagram - Elements and Guidelines Unit 6: Software Testing [10 Hrs] 6.1 Overview of Software Testing 6.2 Levels of testing - Unit, Integration, System and Acceptance testing 6.3 Types of Testing: 6.3.1 White box testing - Data and code coverage testing techniques 6.3.2 Black box testing - Equivalence partitioning, Boundary value 6.3.3 Overview of testing types - Ad-hoc testing, Gorilla testing, random testing and Systematic testing, Static testing and dynamic Testing, Functional, Nonfunctional and Behavioural Testing, Usability Testing, Configuration Testing and Compatibility Testing 6.3.4 Testing practices Unit 7: Software implementation and Project management [6 Hrs] 7.1 Project management 7.1.1 Software estimation - COCOMO Model – II 7.1.2 Project scheduling and tracking - Time line charts and project table. 7.1.3 Software team management - CC, CD, DD team structure 7.1.4 Software project maintenance 7.2 Software Deployment and Advanced Practices 7.2.1 DevOps Practices, Tools, DevOps Lifecycle Unit 8: Case study of information systems [8 Hrs] 8.1 Inventory Control System 8.1.1 Objectives of good inventory control system 8.1.2 Transaction for an inventory system (Purchase, Issue, Purchase Return and Issue Return) 8.1.3 Creation of transaction file, Item master file for purchase, issue, purchase return and sales return. 8.1.4 Consumption analysis, A B C analysis, Year-end processing and Periodic housekeeping
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	8.2 Payroll System 8.2.1 Objectives of payroll systems 8.2.2 Classification of employees based on payment of wages 8.2.3 Leave entitlements, Overtime wages, bonus, provident fund contribution and other deductions, Computerizing a Payroll system
Practical	List of practical will be prepared at the beginning of each semester
Text and Reference Literature	1. Integrated Approach to Software Engineering Pankaj Jalote Narosa Publication. 2. Software Engineering: A Practitioner's Approach 4e/5e, Roger S. Pressmann McGrawHill Publication. 3. Workbook on System Analysis and Design 1e/2e, Garg, Srinivasan PHI. 4. Software Engineering K. K. Aggrawal, Yogesh Singh New Age International Publishers. 5. Fundamentals of Software Engineering Carlo Ghezzi, Mehdi Jazayeri, Dino Mendrilo PHI. 6. Software Engineering Ian Summerville Addison Wesley- Pearson Education. 7. Software Engineering K. L. James PHI. 8. System Analysis and Design Elias M. Awad Galgotia Publication. 9. System Analysis and Design in a changing world John W. Stazinger, Robert B. Jacobson, Stephen D Burd, Thomson Learning. 10. Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale, Jennifer Davis, Katherine Daniels and O'reilly
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



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Digital Marketing

Course Code	
Course Title	SEC: Digital Marketing
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 purpose of the course is to make students aware of current strategies in Digital Marketing.
Course Objective	To provide an in-depth knowledge of most recent digital marketing strategies.
Pre-requisite	Basic understanding of Web, social media.
Course Out come	After completion of this course, the students will be able to implement various techniques and tools for digital marketing.
Course Content	Unit 1: Fundamentals Of Digital Marketing [4 Hrs] 1.1 Types of Digital Marketing 1.2 Marketing v/s Sales 1.3 Inbound v/s Outbound marketing 1.4 Content marketing 1.5 Understanding Leads 1.6 Tools for Digital Marketing 1.7 WWW, Domain Unit 2: Designing Fundamentals With Web Designing [4 Hrs] 2.1 Designing Fundamentals 2.1.1 Tools for Designing 2.1.2 Color Theory 2.1.3 Design Logo and Flyer using Canva 2.2 Introduction to WordPress 2.2.1 Installation and Overview (Dashboard, pages, themes, plugin, category, post, tags) 2.2.2 Designing WordPress website. Unit 3: SEO & SMM Social Media Marketing (Facebook) [8 Hrs] 3.1 Introduction to SEO 3.1.1 Types Of SEO 3.1.2 Google Analytics to Improve SEO Performance 3.2 SMM (Fundamentals of Facebook Marketing) 3.2.1 Creating Facebook Pages, Page Info and Settings, Facebook Page, Custom URL, Invite Page Likes, Featured Video, Scheduling Posts, Facebook Events, Reply and Message, Facebook Insights Reports, Competitor's Facebook Page ,Ban User on Facebook Page

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	3.2.2 Facebook Ad Campaigns: Setting Up Facebook Ad Account, Create Ad - Targeting, Create Ad - Budgeting, Create Ad - Creative, Managing and Editing Ads, Ad Reports and Ad Insights ,Billing and Account 3.3 Overview of LINKEDIN Unit 4: Email Marketing & Affiliate Marketing [4 Hrs] 4.1 Email Marketing Strategy 4.2 Affiliate Marketing 4.2.1 What is affiliate marketing 4.2.2 How Does Affiliate Marketing Work? 4.2.3 Types of Affiliate Marketing
Practical	List of practical will be prepared at the beginning of each semester
Text and Reference Literature	1. Digital Marketing For Dummies, Russ Henneberry and Ryan Deiss (ISBN-13 : 978-1119235590) 2. Digital Marketing All-In-One for Dummies (ISBN-13 : 978-8126534623) 3. Digital Marketing All-In-One Bundle, 2 in 1 Bundle ,Savanna Payne · Wendell Yanick
Teaching Methodology	Discussion, Independent Study, Seminars and Mini 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



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Fundamentals of Sensors and Robotics

Course Code	
Course Title	MDC : Fundamentals of Sensors and Robotics
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	–
Purpose of Course	Provide students with opportunities to develop basic skills in the understanding the operation of electronic sensors based technology and introductory idea of robotics.
Course Objective	The course will advance students knowledge and skills in designing digital systems with sensors such as temperature sensors, ultrasonic sensors etc.
Pr-requisite	Knowledge of digital electronics, hardware interface and peripheral devices; programming skills
Course Out come	1. The student will come to know the various stimuli that are to be measured in real life instrumentation. 2. He will be able to select the right process or phenomena on which the sensor should depend on 3. He will be aware of the various sensors available for measurement and control applications.
Course Content	Unit 1 Fundamentals of Sensors [6 Hrs] 1.1 Introduction to Sensor Technology 1.2 Sensors in IoT 1.3 Need of Sensors 1.4 Types of Sensor - Active, Passive, Static, Dynamic 1.5 Application Areas of Sensors Unit 2 Measurements with Sensors [8 Hrs] 2.1 Sensor Characteristics 2.2 Sensor as Transducer 2.3 Calibration of Sensors - Accuracy and Precision, Types of errors, statistical analysis, probability of errors, limiting errors, sensitivity, linearity, hysteresis, resolution, reproducibility Unit 3 Types of Sensors - I [8 Hrs] 3.1 Thermal sensors – temperature – temperature difference – heat quantity, RTD - Registered Temperature Detector Sensor, LM32, color pyrometry , Application and usage of thermal sensors 3.2 Optical sensors: light intensity – wavelength and color – light dependent resistors, photodiode, photo transistor, Camera Sensors - CCD, CMOS sensors. 3.3 Level Sensors - Direct and Indirect Sensors 3.4 Motion Sensors



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	Unit 4 Types of Sensors - II [8 Hrs] 4.1 Position Sensors, Velocity Sensors ,Acceleration Sensors 4.2 Force and Pressure Sensors, Micro switches, Visible Light and Infrared Sensors 4.3 Touch and Tactile Sensors ,Proximity Sensors, 4.4 Sensors related to Remote Sensing Unit 5 Magnetic and Sound Sensors [6 Hrs] 5.1 Magnetic sensors: magnetic field, magnetic flux density – magneto resistors, Hall sensors, super conduction squids. 5.2 Acoustic or sonic sensors: Intensity of sound, frequency of sound in various media, piezoelectric sensors. Unit 6 RF Sensing [6 Hrs] 6.1 Basic principle of EM fields, 6.2 Antenna, RFID, Near Field and Far Field Sensing, 6.3 Radar and Navigation 6.4 EMI & EMC sensing 6.5 Application of RF Sensors Unit 7 Fundamental of Robotics [6 Hrs] 7.1 What is a Robot?, Classification of Robots ,What is Robotics? ,History of Robotics ,Advantages and Disadvantages of Robots 7.2 Robot Components, Robot Degrees of Freedom, Robot Joints, Robot Coordinates, Robot Reference Frames 7.3 Programming Modes ,Robot Characteristics ,Robot Workspace ,Robot Languages Unit 8 Application and Case Study of Robots [6 Hrs] 8.1 Swarm Robots, Snake robots, bionic robots, 8.2 Human Machine, Interface for various applications, robot cell design, Artificial Intelligence in robotics. 8.3 Peripheral Interfacing with microcontrollers and its programming in C and Arduino platform, 8.4 Robot software frameworks, Robot programming using python, Robotics with python Raspberry Pi, Robot Simulations
Practical	Nil
Text and Reference Literature	1.Doebelin, “Measurement Systems: Application and Design”, McGraw Hill Kogakusha Ltd. 2. Julian W. Gardner, Vijay K. Varadan, Osama O. Awadelkarim “Microsensors, MEMS and Smart Devices”, New York: Wiley, 2001. 3. Henry Bolte, “Sensors – A Comprehensive Sensors”, John Wiley. 4. Jacob Fraden,” Handbook of Modern Sensors, Physics, Designs, and Applications”, Springer.



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	5. Manabendra Bhuyan,” Intelligent Instrumentation Principles and Applications”, CRC Press. 6. Randy Frank,” Understanding Smart Sensors”, Second edition, Artech House. 7. Robot Modeling and Control by Spong, M.W., Hutchinson, H., & Vidyasagar, M., John Wiley (Wiley India Ed.), 2006, ISBN-13: 978-0471649908 8. Robotics Engineering – An integrated approach by Klafter R.D., Chimielewski T.A., Negin M., Prentice Hall of India, 1994, ISBN-13: 978-0134687520 9. Introduction to Robotics, by SAHA, Tata McGraw-Hill Education, 2008, ISBN 9781259083204 10. Fundamental of Robotics Analysis and control: by Robert J. Schilling, Prentice Hall, 1996, ISBN-978-0133444339 11. Robotics Technology and Flexible Automation, by S. R. Deb, Sankha Deb, 2010 McGraw Hill, 2nd edition, 2010, ISBN: 9780070077911 12. Robotics and Image processing by P.A. Janakiraman, Tata McGraw-Hill, 1995, ISBN9780074621677
Teaching Methodology	Discussion, Independent Study, Seminars and Mini 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: All UG
Program: B.Sc.	Type: AECC
Subject: Communication Skills	

Credit: 02	Total Learning Hours: 30 Hours
Course Description: • Identify common communication problems that may be holding learners back • Perceive what the non-verbal messages are communicating to others • Understand the role of communication in the teaching-learning process • Learn to communicate through the digital media • Understand the importance of empathetic listening • Explore communication beyond language	
Student Learning Outcome: After completion of the course the student will be able to • Get a clear understanding of good communication skills • Know what they can do to improve their communication skills.	

Unit – 1 Listening & Speaking Skills (08 Hours)

- 1.1. Techniques of Effective Listening
- 1.2. Listening and Comprehension
- 1.3. Probing Questions
- 1.4. Barriers to Listening
- 1.5. Pronunciation
- 1.6. Enunciation
- 1.7. Vocabulary
- 1.8. Common Errors

Unit – 2 Reading Skill (06 Hours)

- 2.1. Techniques of Effective Reading
- 2.2. Gathering Ideas and Information from a Given Text
- 2.3. Evaluating these Ideas and Information
- 2.4. Interpreting the Text

Unit – 3 Writing and Different Modes of Writing (08 Hours)

- 3.1. The Writing Process
- 3.2. Effective Writing Strategies
- 3.3. Different Modes of Writing
- 3.4. Types of Business Letters - Inquiry, Reply, Complaint
- 3.5. Email, Blogs

Unit – 4 Non – Verbal Communication (08 Hours)

- 4.1. Meaning of Nonverbal Communication (NVC)

- 4.2. Advantages of Using Nonverbal Communication
- 4.3. Introduction to Modes of Nonverbal Communication
 - 4.3.1. Open and Closed Body Language
 - 4.3.2. Eye Contact and Facial Expression
 - 4.3.3. Hand Gestures
- 4.4. Do's and Don'ts in NVC
- 4.5. Learning from Experts
- 4.6. Activities-based Learning

Recommending Reading:

1. Kumar, S and Pushp Lata. Communication Skills. New Delhi, OUP, 2015.
2. Raman, Meenakshi and Sangeeta Sharma. Technical Communication: Principles and Practice. New Delhi, OUP, 201

Online Resources:

1. <https://www.thoughtco.com/what-is-nonverbal-communication-1691351>
2. <https://www.skillsyouneed.com/ips/nonverbal-communication.html>
3. <https://www.andrews.edu/~tidwell/bsad560/NonVerbal.html>
4. <https://artofeloquence.com/pages/the-importance-of-body-language>
5. https://www.tutorialspoint.com/body_language/body_language_open_closed.htm# Life Skills (Jeevan Kaushal) Facilitators' Manual 2022 39
6. <https://study.com/academy/lesson/facial-expressions-in-nonverbal-communicationimportance-lesson-quiz.html>
7. <https://www.sophia.org/tutorials/eye-contact-and-facial-expression>
8. <https://socialtriggers.com/21-hand-gestures-for-powerful-communication/>
9. <https://www.gqrgm.com/interview-dos-donts-importance-nonverbal-communication/> Video
10. <https://www.lifemasterygym.com/blog/power-of-non-verbal-communication>
11. <https://www.youtube.com/watch?v=vyrGNZ4Lzrw>
12. https://www.youtube.com/watch?v=FU0DkL184_4
13. <https://www.youtube.com/watch?v=qRnwdWXbwDY>
14. <https://www.youtube.com/watch?v=1zs-DRBWLmE>
15. Bailey, Stephen. 2010. Academic Writing: A handbook for International Learners. Routledge
16. Hogue, Ann. 1995. First Steps in Academic Writing. Pearson Longman.
17. Taylor, Shirley. 2006. Communication for Business. Pearson Education.
16. <https://learnenglishteens.britishcouncil.org/skills/writing>
18. <http://www.sciedu.ca/journal/index.php/ijhe/article/view/9190>
19. <https://www.britishcouncil.in/>
20. <https://literarydevices.net/context/>
21. <https://courses.lumenlearning.com/waymaker-level3-english/chapter/text-inductivereasoning/>
22. <http://www.criticalreading.com/interpretation.htm>
23. <http://www.criticalreading.com/restatement.htm>
24. <http://www.criticalreading.com/description.htm>
25. https://www.britishcouncil.in/sites/default/files/day_3_-_sruti_akula.pptx
26. https://www.cs.kau.se/cs/education/courses/dvad07/Lectures/Critical_Reading.pdf
27. <https://www.youtube.com/watch?v=fOYtzoil2XI> 2. <https://www.youtube.com/watch?v=VrD9-In6C1o>
28. <https://literarydevices.net/context>
- <https://www.strategiesinlanguagelearning.com/how-to-improve-english-pronunciation/>
29. <http://giftarist.expertscolumn.com/article/speech-delivery-importance-enunciation-andpronunciation>

30. <https://www.wikihow.com/Enunciate>
31. <https://englishforeveryone.org/PDFs/Homonyms,%20Homographs,%20Homophones.pdf>
32. <https://learnenglishteens.britishcouncil.org/exams/speaking-exams/fluency>
33. <https://www.learnpick.in/blog/8-common-mistakes-make-speaking-english>
34. <https://www.fluentu.com/blog/english/common-mistakes-in-english>

Sarvajanik University

Faculty of Science

Faculty: Science	Department: Computer Sci
Program: B.Sc. (Hons)	Type: Value Added Course (VAC)
Subject: Indian Knowledge System (Gananshastra)	Credits: 2
Semester: 3	

References:

1. Introduction to Indian Knowledge Systems - Concepts and Application, B. Mahadevan, Vinayak Rajat Bhat, Nagendra Pava R.N., PHI Publication
2. Sivananda S. All about hinduism. Sivananda literature research institute; 1988.
3. Dharampal G. Essential Writings of Dharampal. Publications Division Ministry of Information & Broadcasting; 2017 Nov 3.
4. Bajaj J, Śrīnivāsa MD. Sanatana Bharat, jagrita Bharat= Timeless India, resurgent India: a celebration of the land and people of India. (No Title).

Unit 1: Number System in IKS - Part 1

(07 hours)

- Number System in India - Historical Evidence
- Features of Indian Numeral System - Concept of zero and its importance, Large Number Representation, Place Value Numerals, Decimal System

Unit 2: Number System in IKS- Part 2

(07 hours)

- Unique Approaches to Represent Numbers
 - Bhuta Samkhya System,
 - Katapyadi system
- Pingala and Binary System
- Binary word system

Unit 3: Arithmetic

(08 hours)

- Square of Number,
- Square Root
- Square Root of Imperfect Squares
- Binary Mathematics and Combinatorial Problems in Chanda Shahstra of Pingala 300 BCE
- Magic Squares in India

Unit 4: Series and Progression

(08 hours)

- Series - upaciti
- Sum of Series of Squares and Cubes
- Repeated sum of series - Varasnkhalita
- Pi approximation techniques
- Contribution of Indian Mathematicians