



॥ तमसो मा ज्योतिर्गमय ॥

VISION

To provide equal opportunities for value based global education for creating an Enlightened Society

MISSION

To establish and facilitate educational institutions in the region for providing affordable value based global education to all who aspire to study and to create opportunities to educators, social workers and philanthropists to serve society



SARVAJANIK
UNIVERSITY

INCLUSIVE | INTEGRATED | INNOVATIVE

creating an enlightened society...

UNIVERSITY OFFICE

Dr. R. K. Desai Marg, Athwalines,
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CURRICULUM FOR

“BACHELOR OF SCIENCE (HONS)” / “BACHELOR OF SCIENCE (HONS WITH RESEARCH)”

B.Sc. (Hons)(Artificial
Intelligence and Data
Science)

B.Sc. (Hons with Research)
(Artificial Intelligence and
Data Science)

SEM – 3

SEM – 4

w.e.f. Academic Year 2026-27

Constituent Institute:

**Shree Ramkrishna Institute of
Computer Education and Applied
Sciences (SRKI)**



Course Curriculum

BACHELOR OF SCIENCE (Hons) / BACHELOR OF SCIENCE (Hons with Research) (ARTIFICIAL INTELLIGENCE AND DATA SCIENCE) Sem-3 and 4

The Course Curriculum of Bachelor of Science (Artificial Intelligence and Data Science) was proposed and drafted by **Academic and Curriculum Committee of Computer Science** under the Faculty of Computer Science and Applications in the meeting held on **11-09-2026** and recommended to '**BOARD OF STUDIES**' for approval.

Mr. Jayesh Pushtiwala

Chairman, Academic

& Curriculum Committee

Science

Place of the meeting

Sarvajani University Office

Sign

The proposed Course Curriculum was approved by **Board of Studies; Computer Science** under the Faculty of Computer Science and Applications in the meeting held on **14-09-2026** and was recommended to the '**FACULTY**' for approval.

Dr. Shripal Shah

Chairman,

Board of Studies- Computer Science

Place of the meeting

Sarvajani University Office

Sign

The Course Curriculum approved by the **Faculty of Computer Science and Applications** in the meeting held on **14-09-2026** and was recommended to '**ACADEMIC COUNCIL**' for approval.

Dr. Shripal Shah

Chairman & Dean,

Faculty of Computer Science and
Applications

Place of the meeting

Sarvajani University Office

Sign

The Course Curriculum approved by the '**Academic Council of Sarvajani University**' in the meeting held on **16-09-2026**.

Mr. Ashish Desai

Member Secretary,

Academic Council

& I/c. Registrar,

Sarvajani University

Place of the meeting

Sarvajani University Office

Sign

The approved curriculum of Bachelor of Science (Hons) / Bachelor of Science (Hons with Research) (Artificial Intelligence and Data Science) Sem-3 and 4 is with effect from the Academic year 2026-27

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B. Sc. (Honours)
(Artificial Intelligence and Data Science)

B.Sc. (Honours with Research)
(Artificial Intelligence and Data Science)

DETAILED CURRICULUM
(W.E.F. 2026-27)

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Bachelor of Science Artificial Intelligent and Data Science 2026-27

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.

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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.

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Semester wise course group wise credit allocation for Under Graduate Programme
(Annexure I)

Semester	Major						Minor		Skill Enhanceme nt		Ability Enhanceme nt		Multidis cipline.		Value Added		Tot al Cr edi ts
	Major No. of Papers	Theory		Lab		Tot al Ma jor Cre dits											
		Theo ry Hour s	T he or y C re di ts	Lab Hrs	Lab Cred its		No . of Pa pe rs	Cre dits	No . of Pa pe rs	Cre dits	No . of Pa pe rs	Cre dits	No . of P a pe rs	Cr edi ts	No . of Pa pe rs	Cr edi ts	
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	Intr nsp	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	2+2+2 +2	1+1+1 +1	16	1	4	1	2							22
8 (Honors)	4	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					96/8 8	8	32	7+I	18/2 6	5	10	3	12	4	8	176

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SEMESTER- 3

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Semester 3								
Course Code	Title	Teaching Hrs. per week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
BSCS31310	Python Programming- I(TH)	3	-	3	2	40	35	75
BSCS31311	Python Programming- I(PR)	-	2	1	2	10	15	25
BSCS31307	System Analysis, Modelling, Design and Management	4	-	4	2	50	50	100
BSCS31312	Fundamentals of Data Analytics and Statistical Methods(TH)	3	-	4	2	40	35	75
BSCS31313	Fundamentals of Data Analytics and Statistical Methods(PR)	-	2	1	2	10	15	25
BSCS35312	Digital Marketing Lab	-	4	2	2	25	25	50
BSCS35312	Communication Skills	2	-	2	2	25	25	50
BSGN33321	Fundamentals of Sensors and Robotics	4	-	4	2	50	50	100
BSGN36306	Indian Knowledge System (Gananshastra)	2	-	2	2	25	25	50
BSGN34314	Building Digital Campaigns with AI	2	-	2	2	25	25	50
BSGN34313	Pattern Discovery and Data Visualization	2	-	2	2	25	25	50
NOTE: Following subjects are listed as elective subjects of the semester. Sec 3: 1. Communication Skills 2. Building Digital Campaigns with AI 3. Pattern Discovery and Data Visualization								

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Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSCS31310	Course Name	Python Programming- I(TH)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (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 Out come	After completion of this course, the student will be capable of performing application level programming using python language with basic data science operations.

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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

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	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

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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSCS31311	Course Name	Python Programming- I (PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
1	—	-	2	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. Practical Assignments based on theory content: 1. Basic of python programming

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	2. Implementation of Control statements and data type 3. Implementation of List and tuples methods 4. Implantation of string methods 5. Practical assignment of Set and dictionary 6. Nested Dictionary 7. Functions and modules 8. Text file handling
Practical	List of practicals will be prepared at the beginning of each semester.
Reference Books	As per paper Major - Python Programming-I.

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Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSCS31307	Course Name	Major : System Analysis, Modelling, Design and Management			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
4	4	-	-	50	50	100

Purpose of Course	The purpose of the course is to make students understand the 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 the 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

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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 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 –

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	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 , 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.
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	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 Payroll System 8.2.1 Objectives of payroll systems 8.2.2 Classification of employees based on payment of wages Leave entitlements, Overtime wages, bonus, provident fund contribution and other deductions, Computerizing a Payroll system
Practical	NIL
Reference Books	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.

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	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'relly
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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSCS35312	Course Name	Digital Marketing Lab			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
2	-	-	4	25	25	50

Purpose of Course	The purpose of the course is to make students aware of current strategies in Digital Marketing with Practical knowledge.
Course Objective	To provide an in-depth knowledge of most recent digital marketing strategies.
Pre-requisite	Basic understanding of Web development and social media.
Course Out come	After completion of this course, the students will be able to implement various techniques and tools for digital marketing

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Course Content	1. Fundamentals Of Digital Marketing ● Introduction to Digital marketing ● Types of Digital Marketing ● Designing Fundamentals with tool ● Understanding Leads ● Tools for Digital Marketing ● Basics of WWW, Domain ● SEO and types of SEO ● Email and Content marketing ● Affiliate marketing 2. Color theory using color wheel 3. Design logo using canva 4. Design banner using Canva 5. WordPress Installation and Basic site setup 6. Working with pages, category, tag and settings 7. Designing WordPress Website 8. Facebook marketing and Page Creation ● (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) 9. Facebook Ad Campaigns ● Types of campaigns (Traffic,Awareness,Lead) ● Create Ad - Targeting, Create Ad - Budgeting, Create Ad - Creative(using Canva), Managing and Editing Ads. 10. Submission of all Practical Assignment work.
Practical	A list of practicals will be prepared at the beginning of each semester.
Reference Books	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

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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSCS35312	Course Name	Communication Skills			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
2	2	-	-	25	25	50

Purpose of Course	● 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
Course Objective	To enhance communication skill
Pre-requisite	Nil

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Course Out come	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.
Course Content	Unit – 1 Listening & Speaking Skills [8 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 [6 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 [8 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 [8 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

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Practical	NIL
Reference Books	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.

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	18. https://learnenglishteens.britishcouncil.org/skills/writing 19. http://www.sciedu.ca/journal/index.php/ijhe/article/view/9190 20. https://www.britishcouncil.in/ 21. https://literarydevices.net/context/ 22. https://courses.lumenlearning.com/waymaker-level3-english/chapter/text-inductivereasoning/ 23. http://www.criticalreading.com/interpretation.htm 24. http://www.criticalreading.com/restatement.htm 25. http://www.criticalreading.com/description.htm 26. https://www.britishcouncil.in/sites/default/files/day_3_-_sruti_akula.pptx 27. https://www.cs.kau.se/cs/education/courses/dvad07/Lectures/Critical_Reading.pdf 28. https://www.youtube.com/watch?v=fOYtzoil2XI 2. https://www.youtube.com/watch?v=VrD9-In6C1o 29. https://literarydevices.net/context https://www.strategiesinlanguagelearning.com/how-to-improve-english-pronunciation/ 30. http://giftarist.expertscolumn.com/article/speech-delivery-importance-enunciation-andpronunciation 31. https://www.wikihow.com/Enunciate 32. https://englishforeveryone.org/PDFs/Homonyms,%20Homographs,%20Homophones.pdf 33. https://learnenglishteens.britishcouncil.org/exams/speaking-exams/fluency 34. https://www.learnpick.in/blog/8-common-mistakes-make-speaking-english 35. https://www.fluentu.com/blog/english/common-mistakes-in-english
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Name of College: Shree Ramkrishna Institute of Computer Education and Applied Sciences						
Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSGN33321	Course Name	Fundamentals of Sensors and Robotics			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
4	4	-	-	50	50	100

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.
Pre-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

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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 Motion Sensors 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]
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	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

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Reference Books	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. 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 Robotics and Image processing by P.A. Janakiraman, Tata McGraw-Hill, 1995, ISBN9780074621677 .
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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSGN36306	Course Name	Indian Knowledge System (Gananshastra)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
2	2	-	-	25	25	50

Purpose of Course	This course serves as a bridge between traditional Indian knowledge and modern scientific education. It introduces students to the rich historical development and cultural heritage of Indian mathematics and its classical texts.
Course Objective	The course emphasizes the contributions of ancient Indian mathematicians and mathematical traditions. Students will explore historical mathematical knowledge alongside modern approaches, study traditional Indian methods, and develop logical thinking and problem-solving skills.
Pre-requisite	Basic Knowledge of General Indian History.
Course Out come	After completion of this course, students will be able to identify and appreciate key contributions of ancient Indian mathematics and apply traditional Indian mathematical algorithms and geometric principles alongside modern mathematical methods to solve mathematical problems.

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Course Content	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 - Varasnkalita • Pi approximation techniques • Contribution of Indian Mathematicians
Practical	Nil

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Reference Books	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).
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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSGN34314	Course Name	Building Digital Campaigns with AI			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
2	2	-	-	25	25	50

Purpose of Course	This course provides a comprehensive introduction to marketing in the digital and AI-driven era, beginning with core concepts such as segmentation, targeting, positioning, and marketing mix. It then builds into digital marketing fundamentals, covering key channels, customer behavior, and performance metrics
Course Objective	The course emphasizes practical skills in content, social media, influencer, email marketing, and SEO, while integrating AI tools across each domain.
Pre-requisite	Participants are expected to have a basic understanding of marketing principles. A graduate-level educational background in fields such as business, management, commerce, engineering, media, or related disciplines is preferred.
Course Out come	Learners will also explore how artificial intelligence enhances campaign creation, personalization, and analytics. The course will equip students with both strategic understanding and hands-on capabilities to navigate modern marketing effectively.

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Course Content	Unit 1: Fundamentals of Digital Campaign • Introduction to Marketing • Introduction to Digital campaigning • Role of AI in Digital campaigning Unit 2: AI enhanced content development • Introduction to Content Marketing • Planning & Writing Content • AI Tools for Content Creation • Basic Content Performance Metrics Unit 3: Social Media campaigning • Introduction to Social Media campaigning • Social Media Plan • Social Media Marketing & AI Unit 4: AI driven Email campaigning • Email Marketing Foundations • AI-powered email campaign
Practical	Nil
Reference Books	1. Kotler, P., & Keller, K. L. (2016). <i>Marketing management</i> (15th ed.). Pearson. 2. Dodson, I. (2016). <i>The art of digital marketing: The definitive guide to creating strategic, targeted, and measurable online campaigns</i>. Wiley. 3. Gupta, S. (2022). <i>Digital marketing</i> (3rd ed.). McGraw Hill Education.

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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1.0		
Semester	III		Effective From	June, 2026		
Course Code	BSGN34313	Course Name	Pattern Discovery and Data Visualization			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Semester end examinations (SEE)	Total
2	2	-	-	25	25	50

Purpose of Course	Statistical Data Analysis provides a comprehensive introduction to data analytics through theory. The course covers data classification, descriptive and inferential statistics, and exploratory data analysis.
Course Objective	To develop skills in visualization, trend analysis, stochastic modeling, and forecasting techniques.
Pre-requisite	Provides a comprehensive introduction to data analytics through theory and hands-on practice. The course covers data classification, descriptive and inferential statistics, and exploratory data analysis.
Course Out come	Every concept is supported through practical implementation using Python code provided to Students. Although the examples are useful primarily from climate and atmospheric datasets, the methods are broadly applicable across disciplines.

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Course Content	Unit 1: Foundations of Statistical Data Analytics • Introduction • Categories of data analytics • Data analytics lifecycle • Descriptive vs Inferential Statistics Unit 2: Data Visualization • Data Visualization using plotting methods • Probability distributions in data predicting • Data Exploration with Python Unit 3: Forecasting and Trend detection • Stationarity/Non-stationarity in data • Statistical tests like Unit root • Trend Analysis • Statistical approaches to Forecasting Unit 4: Data driven pattern discovery • Multivariate techniques • Clustering • Pattern recognition • Self-Organizing Maps (SOM)
Practical	Nil
Reference Books	1. Peck and Devore, Statistics: The Exploration and Analysis of Data, 7th edition, Thomson-Brooks/Cole 2012 2. Wes McKinney PYTHON For Data Analysis 3rd Edition O'Reilly Media 2022 3. Daniel S. Wilks, Statistical Methods in the Atmospheric Sciences (4th Edition) McGraw - Hill 2011

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Faculty	Computer Science and Applications		Program	B.Sc. Artificial Intelligence and Data Science		
Year	2026		Version	1		
Semester	III		Effective From	2026		
Course Code	BSCS31312	Course Name	Fundamentals of Data Analytics and Statistical Methods(TH)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Term end examinations (SEE)	Total
4	3	0	0	40	35	75

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Purpose of Course	The purpose of a data analytics and statistics course is to teach how to convert raw, disorganized data into clear, reliable insights for decision-making. Instead of relying on guesswork or intuition, it teaches to use mathematical frameworks and software tools to prove findings with evidence.
Course Objective	◆ To equip students with the core mathematical and programming skills needed to collect, process, and interpret quantitative data ◆ To understand Data Analytics and methods used for data processing using spreadsheet ◆ Implementation of data preprocess and data distribution ◆ Introduces Solver and What-If Analysis for complex business optimization and modeling.
Pre-requisite	high school algebra, basic computer literacy, and strong analytical reasoning
Course Out come	After completion of this course, gain the ability to manipulate messy datasets, run rigorous statistical tests, and present findings to data process.
Course Content	Unit-1: Introduction to Statistics [7] 1.1. Introduction to Statistics, role of statistics on data analysis 1.1.1. Data, types of data: Types of data: primary, secondary - quantitative and qualitative data. 1.2. Measurements : 1.2.1. Types of Measurements: nominal, ordinal, discrete and continuous data, scales 1.2.2. Measures of Variability (Dispersion) , range, variance and Standard Deviation 1.3. Data collection, data Distribution: 1.3.1. Data Presentation 1.3.2. Frequency Distributions 1.4. Overview of Graphical Representation of data – The Statistical Histogram, dot plots, box-whisker plots, and scatter plots 1.5. Statistical software Unit 2: Descriptive statistics [6] 2.1. Central Tendency: Mean, median, Quantiles, Dispersion/Spread, Shape of Data 2.2. Inferential Statistics: Sampling Methods, Confidence Intervals, Hypothesis Testing, p-values & Significance Levels, 2.3. Specific Tests: Z-tests, t-tests (Independent, Paired), Chi-Square tests, and ANOVA (Analysis of Variance)

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	Unit 3: Introduction to Data Analytics [8] 3.1. Basic of Data, Information, data analysis, Data Analysis Vs Data Analytics 3.2. Common data problems, human input in analytics and overview of existing analytics tools 3.3. Data Analytics, Types of Data Analytics((descriptive, diagnostic, predictive, prescriptive), 3.4. Applications of Data Analytics in the Real World 3.5. Framework – Data Analytics 3.6. CRISP-DM framework :business understanding, data understanding, data preparation, modelling, evaluation, deployment, and monitoring. Unit 4: SpreadSheet tool for Data Analysis -1 [7] 4.1. Overview of Sheet/Excel tables, conditional formatting, data validation, sophisticated filters, data linking and hyperlinks, sophisticated data methods. 4.2. Data Cleaning Text Cleaning & Standardization (TRIM(),CLEAN(), PROPER(),UPPER() etc...),Parsing & Structuring Data (LEFT(), MID(),SPLIT(), outlier identification, Handling Missing Values & Errors (IFERROR(),IFBLANK(),REPLACE(), etc.. Unit 5: SpreadSheet tool for Data Analysis-2 [7] 5.1. Importing and Exporting Files: CSV File – JSON File – txt File – Excel File – Xml File 5.2. Dashboarding, collaboration and integration Unit 6: Predictive Modeling, Forecasting & Scenario Analysis [6] 6.1. Statistical Trend Forecasting 6.2. Reverse Analytics (Goal Seeking) 6.3. Scenario Matrix Modeling 6.4. What-If Analysis vs. Descriptive Analytics (Backward vs. Forward)
Text and Reference Literature	1. Introduction to Statistics and Data Analysis ,Roxy Peck ,Chris Olsen , Jay L. Devore ,Publisher: Richard Stratton ,ISBN-13: 978-0-8400-5490-6 2. Practical Statistics for Data Scientists ,Andrew Bruce, Peter Bruce, and Peter Gedeck ,ISBN-13: 978-1492072942 3. Excel Data Analysis for Dummies , Paul McFedries ,5th Edition (1119844428) 4. Mastering Data Analytics with Excel ,Dr. Isaac Gottlieb ,978-9365891881

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Year	2026-27		Version	1		
Semester	III		Effective From	2026		
Course Code	BSCS31313	Course Name	Fundamentals of Data Analytics and Statistical Methods(PR)			
Teaching Scheme				Examination Scheme		
Credits	Lecture (L)	Tutorial (T)	Practical (P)	Continuous and Comprehensive Evaluation (CCE)	Term end examinations (TEE)	Total
1	0	0	2	10	15	25

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Purpose of Course	The purpose of a data analytics and statistics course is to teach how to convert raw, disorganized data into clear, reliable insights for decision-making. Instead of relying on guesswork or intuition, it teaches to use mathematical frameworks and software tools to prove findings with evidence.
Course Objective	◆ To equip students with the core mathematical and programming skills needed to collect, process, and interpret quantitative data ◆ To understand Data Analytics and methods used for data processing using spreadsheet ◆ Implementation of data preprocess and data distribution
Pre-requisite	high school algebra, basic computer literacy, and strong analytical reasoning
Course Out come	After completion of this course, gain the ability to manipulate messy datasets, run rigorous statistical tests, and present findings to data process.
Course Content	Based on Fundamentals of Data Analytics and Statistical Methods(TH)
Text and Reference Literature	1. Introduction to Statistics and Data Analysis ,Roxy Peck ,Chris Olsen , Jay L. Devore ,Publisher: Richard Stratton ,ISBN-13: 978-0-8400-5490-6 2. Practical Statistics for Data Scientists ,Andrew Bruce, Peter Bruce, and Peter Gedeck ,ISBN-13: 978-1492072942 3. Excel Data Analysis for Dummies, Paul McFedries ,5th Edition (1119844428) 4. Mastering Data Analytics with Excel ,Dr. Isaac Gottlieb ,978-9365891881