

**Shirdi Sai Rural Institute's**  
**Arts, Science and Commerce College, Rahata**  
**Department of Mathematics**

**1. Scope and Importance of Department-**

Mathematics is the queen of science and the language of nature. All segments of Mathematics have its own independent applications to a wide variety of jobs. For instance, Algebra is a very significant part of computer science, cryptology and computer networking. Calculus and Differential equations are widely utilized in Computer Engineering, network modelling in Business and Economics sectors etc. Information Technology field is very much indebted to Mathematics. Mathematically rooted components of computer science for instance, computational complexity and algorithm implementation, and formal methods etc. require good mathematical abilities and knowledge. The capability to think and communicate mathematically always benefits software programmers, although in modest ways. Beyond the imagination and speculation one can't comprehend the concepts in Engineering sciences, Physics, Computer Sciences, Management Sciences and Social Sciences without Mathematics. The importance of Mathematics is due to its increasing effectiveness in steps with the new developments in sciences.

**2. Introduction of Department-**

Department of Mathematics was established in June 1997, since the inception of the college. The department conducts courses upto S.Y. B.Sc. in a free and frank atmosphere. Faculty uses Internet and other Educational Aids for updating his knowledge and teaching skills. The faculty is actively participates in the Curriculum Development Workshops organized from time to time. The department has organized a State Level Seminar on 17-18 January, 2020 entitled Mathematical Software and its application for Students'. Also, students are encouraged to participate in programmes like Madhava Mathematics Competition, MTTS, IIT Workshop, etc. Personal attention is paid to each student of the Department. Student, Teacher Relationship is friendly due to which we can shape their carrier.

**Vision:**

Acquiring conceptual understanding, nature and structure of Mathematics, its processes and applications.

**Mission:**

- i) Provide Mathematical experiences, opportunities and relevant applications as expressed by numbers, symbols and figures.
- ii) Impart qualitative knowledge of Mathematics.

**Objectives:**

- i) To produce self-dependent, well equipped, knowledgeable, cultured and responsible citizen.
- ii) To motivate students for higher education and research in Mathematics.
- iii) To apply critical and logical thinking for problem solving.
- iv) To adapt appropriate strategies to investigate Mathematical conjectures.
- v) To apply languages and symbols of Mathematics to express Mathematical ideas precisely.
- vi) To build confidence to understand and apply Mathematics.

**3. Year of Establishment- 1997- F.Y.B.Sc.**
**4. Detail of Programmes / Courses offered (UG, PG, M. Phil., Ph.D., Integrated Masters; Integrated Ph.D., Short term courses, Career oriented courses, etc. (Current academic year) 2024-25**

Sr. No	Programme level	Name of the programme/ Course	Duration	Entry qualification	Medium of Instruction	Sanctioned/ Approved student strength	No. of Student admitted
1	UG	F.Y.B.Sc	1. years	12 th Science	English	120	18
2	UG	S.Y.B.Sc.	1. years	F.Y.B.Sc	English	120	11

**5. Annual/ semester/choice based credit system/elective course pattern (programme wise)**

Programme	Pattern	Year of Implementation
B. Sc.	B.Sc.(Regular 2019) CBCS	2019
B. Sc.	(National Education Policy- 2020)2024 Pattern	2024

**6. Number of Teaching and Non-teaching positions in the department**

Designation	Sanctioned	Filled
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Professors	--	--
Associate Professors	--	--
Asst. Professors	1	1
Lab Assistant	--	--
Peon	1	1

7. Faculty profile with name, qualification, designation, specialization, (Ph.D. / M. Phil. etc)

Sr. No.	Name of faculty	Qualification	Year of appointment	Designation	Specialization	Number of years of teaching experience (Year and months)	
1	Dr. T. K. Kumkar	M.Sc., B.Ed.,M.Phil, Ph.D.	1999	Assistant Professor	Mathematics	25	07

8. Ongoing /completed research projects by faculty funded by governmental and non-governmental agencies

Sr. No	Name of the principal investigator	Duration of the project	Name of the research project	Amount fund received	Name of funding agency	Year of sanction	Dept. of recipient
1	Nil						

9. Research papers published in journals notified on UGC website (Last five years)

Sr. No.	Name of Journal	Title of Research Paper	ISSN/ ISBN No.	Whether peer reviewed. Impact Factor, if any
Author- Dr. T. K. Kumkar				
1	International Journal of Multifaceted & Multilingual Studies	Methods to obtain Lagrange Multiplier in the Variational Iteration Technique for solving	2350-0476	Peer Reviewed

		nonlinear differential equations		
2	International Journal of Multifaceted & Multilingual Studies	Numerical Solution for Class of nonlinear Partial Differential Equations using Variational Iteration Technique.	2350-0476	Peer Reviewed
3	Journal of Applied Science and Computations	Determination of Lagrange Multiplier in the Variational Iteration Method by some methods.	1076-5131	Peer Reviewed
4	Aarhat Multidisciplinary International Education Research Journal	Variational Iteration Technique for nonlinear boundary value problems.	2278-5655	Peer Reviewed
5	An International Multidisciplinary Quarterly Research Journal	Solution of Homogeneous Nonlinear Advection Equation by using Variational Iteration Technique.	2277-5730	UGC listed
6	'Research Journey' International E-Research Journal	A Study of Algebraic Equation by Some Iterative Methods	2348-7143	Peer Reviewed

10. Number of books and chapter in edited volumes/Books Published

Title of the book/chapter published	National/ International	Year of publication	ISBN/ISSN No.	Name of the publisher
Author- Dr. T. K. Kumkar				
A Text Book for S. Y. B.Sc./S. Y. B. A. Mathematics (2013 Pattern) Paper I-MT 211: MULTIVARIABLE CALCULUS-I	National	2015	---	Director, BCUD, S. P. Pune University

11. Name of Research Guides-

Sr. No.	Name of research guide	Ph. D/ M. Phil
	1 NA	

**12. Number of Ph. D/ M. Phil awarded by faculty**

Name of Ph. D/M. Phil scholar	Name of the Guide/s	Title of the thesis	Year of registration of scholar	Year of awards of Ph. D/ M. Phil.
NA				

**13. Faculty as chairman/members in National committees/International Committees/ Editorial Boards/BOS/University committees etc.**

Sr. No.	Name of faculty	Name of the body in which full time teacher participated	Member of editorial board	Reviewer
NA				

**14. Student undertaking field projects/ internships-**

1. a) Percentage of students who have done in-house projects including inter Departmental / Programme

Program name	Program code	Year	No. student undertaking field projects/Internships
Nil			

1. b) Percentage of students placed for projects in organizations outside the institution i.e.in Research laboratories/Industry/society other agencies

Program name	Program code	Year	No. student undertaking field projects/Internships
Nil			

**15. Awards / Recognitions received by faculty**

Year of awards	Name of full time teachers receiving awards from state level, National level, International level	PAN	Designation	Name of the award, fellowship, received from government or recognized bodies
Nil				

**16. Numbers of awards / Medals for outstanding performance in sports/cultural activities in National/ International/ State level etc. received by students**

Year	Name of the award/Medal	National/International/State etc.	Sports/Cultural	Aadhar/Student ID No.	Name of the Student
Nil					

**17. Students Qualifying in State/National/International level examination (NET, SET, GATE, GMAT, GRE, TOEFL/UPSC/MPSC/State government examination, etc.)**

Year	Registration No./Roll for the examination/Name	Number of students selected								
		SET	NET	GATE	GMAT	CAT	RGE	TOFEL	Civil services	State Govt. Examinations/Others
NA										

**18. Student progression to higher studies. UG to PG, PG to M. Phil., PG to Ph. D, M. Phil to Ph. D, Ph. D to post-Doctoral, etc.**

**1. UG to PG**

Sr. No.	Program Graduated From	Department Graduated from	Student Name	Name of the Institute Joined	Name of the Program admitted

NA
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1. PG to M. Phil

Sr. No.	Program Graduated From	Department Graduated from	Student Name	Name of the Institute Joined	Name of the Program admitted
NA					

1. PG to Ph. D or M. Phil to Ph. D.

Sr . No.	Program Graduated From	Department Graduated from	Student Name	Name of the Institute Joined	Name of the Program admitted
NA					

**19. Placement of outgoing students (Last five years)**

Sr. No.	Contact detail	Number of students placed	Name of the employer with contact details	Package received	Program graduated from
NA					

**20. List of alumni/contribution**

Sr. No.	Name of Alumni	Year of Graduation/Post Graduation	Position held	Contact detail (Email, Mobile No.)	Quantum of Contribution
Nil					

**21. List of eminent academicians and scientists / visitors to the department-**

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**22. Seminars/ Conferences/Workshops organized & the source of funding-**

Sr. No.	Level National/ International/ State	Name of the workshop/Seminar	Funding agency	Amount sanctioned	Durations (From-To)	Number of participants
1	State	State Level Seminar on Mathematical Software and Its Application for Student	Planning and Development, S.P.Pune University	100000/-	17-18 Jan.2020	147

**Student profile programme/course wise (Last Five Years):**

Year	Name of the Course/programme (refer question no.4)	Applications received	Enrolled		Total number of Students
			*M	*F	
2018-19	F.Y.B.Sc.	44	16	28	44
	S.Y.B.Sc.	38	15	23	38
2019-20	F.Y.B.Sc.	35	9	26	35
	S.Y.B.Sc.	34	11	23	34
2020-21	F.Y.B.Sc.	31	10	21	31
	S.Y.B.Sc.	34	9	25	34
2021-22	F.Y.B.Sc.	35	12	23	35
	S.Y.B.Sc.	26	10	16	26
2022-23	F.Y.B.Sc.	19	12	7	19
	S.Y.B.Sc.	33	11	22	33
2023-24	F.Y.B.Sc.	12	6	6	12
	S.Y.B.Sc.	14	7	7	14
2024-25	F.Y.B.Sc.	18	8	10	18
	S.Y.B.Sc.	11	5	6	11

\*M = Male \*F = Female



**23. Departmental result**

Year	Program Code	Program Name	Number of students appeared in the final year examination	Number of students passed in final year examination
2018-19	11719	S.Y.B.Sc.	37	30
2019-20	11719	S.Y.B.Sc.	34	33
2020-21	11719	S.Y.B.Sc.	34	34
2021-22	11719	S.Y.B.Sc.	26	24
2022-23	11719	S.Y.B.Sc.	33	32
2023-24	11719	S.Y.B.Sc.	14	13

**24. Number of linkages for faculty exchange/student exchange/training/internship/field trips/job on training/research etc.**

Sr. No.	Title of the linkage	Name of the partnering institution/ industry /research lab with contact details	Year of commencement	Duration (From-To)	Nature of linkage
	Nil				

**25. Number of functional MoU's with corporate houses/ industries/other institutes/Universities, etc.**

Organisation with which MoU is signed	Name of the institution/ industry/ corporate house	Year of signing MoU	Duration	List the actual activities under each MoU year wise	Number of students/teachers participated under MoUs
Nil					

## 26. Details of Infrastructural facilities

### 1. a) Library

Sr. No.	Name of Books	Publisher	Number of copies
01	Algebra and Geometry	Nirali	39
02	Calculus	Nirali	31
03	Calculus-I	Nirali	2
04	Calculus-II	Nirali	1
05	Analytical Geometry	Nirali	1
06	Multivariable Calculus-I	BCUD, S.P. Pune University	1
07	Linear Algebra	Nirali	26
08	Discrete Mathematics	Nirali	26
09	Multivariable Calculus-II	Nirali	17
10	Vector Calculus	Nirali	24
11	Numerical Methods and its applications	Nirali	8
12	Laplace Transform and Fourier Series	Nirali	9
13	Numerical Analysis	Nirali	5
14	Differential Equation	Nirali	9
15	Multivariable Calculus-I	Nirali	19
16	Calculus of Several Variables	Nirali	11
17	Graph Theory	Nirali	1
18	Computational Mathematics with Maxima Software	Nirali	1
19	Maxima Software	Nirali	1
20	Advanced Engineering Mathematics	Pearson Education	2
21	Advanced Engineering Mathematics	Cengage Learning	2
22	Advanced Engineering Mathematics	Tata MC Graw Hill	2

23	Engineering Mathematics	Universities Press	3
24	Discrete Mathematics	Pearson Education	2
25	Pradnyas Objective Mathematics-II	Nikita	1
26	Introductory Methods of Numerical Analysis	PHI Learning Private Limited.	1
27	Introduction to Partial Differential Equation	PHI Learning Private Limited.	1
28	Numerical Methods	Khanna	1
29	Applied Mathematics	Nirali	1
30	Engineering Mathematics-II	Technical	1
31	Engineering Mathematics-III	Everest	1
32	Numerical Methods	Tata MC Graw Hill	2
33	Engineering Mathematics-III	Tech-Max.	1
34	Vidyabharatees Complete Objective Mathematics	Vidyabharatee	5
35	Simplified Mathematics and Statistics	Vidyabharatee	6
36	Science Dictionary	Vidyabharatee	1
37	Higher Engineering Mathematics	Tata MC Graw Hill	2
38	Advanced Engineering Mathematics	Wiley Student Edition	3
39	Discrete Mathematics and its application	Tata MC Graw Hill	2
40	Engineering Mathematics	SciTech	4
41	A Text Book of Degree Mathematics	Asian Book Private Ltd.	4
42	Engineering Mathematics	PHI Learning Private Limited.	4
43	A Text Book of Applied Mathematics	Pune Vidyarthi Griha Prakashan	5
44	Mathematics and Statistics	Phadake	10
45	Mathematics and Statistics	MSBSHSE,Pune	19

1. b) Internet facilities for Staff & Students- 100 mbps net facilities is available

1. c) Class rooms with ICT facility- 01

1. d) Laboratories

Sr. No.	Facility	Detail	Area
NA			

1. e) List of Equipments/Instruments

**Equipments Purchased under UGC Additional/ Development Grant**

Nil

**27. Details on student enrichment programmes (special lectures / workshops / seminar) with external experts**

Sr. No.	Enrichment programmes- Special lectures	Experts (Alumni)
1	One day Seminar on “Research Projects and Patents” on the occasion of National Science Day-2019 on 28 <sup>th</sup> February 2019	Dr.A.G.Gadhve (P.V.P.college,Pravaranagar)
2	State Level Seminar on “Mathematical Software and Its Application” on 17-18 Jan. 2020	Dr.S.B.Gaikwad(Chairman ,BOS in Maths,SPPU) Dr.K.C.Takle (Bytco College,Nasik) Dr.Amjad Shaikh(Poona College) Dr.Veena Kshirsagar Prof.Krishna Ghode.
3	Webinar on “Mathematical Puzzles for everton” 01 Oct. 2021	Prof. A.G.Lagad (Dept.of Mathematics,Ahmednagar College)
4	Guest lectures on the occasion of National Mathematics day on 22 Dec.2021	Prof.B.L.Pendharkar (Padmashri Dr,Vitthalrao Vikhe Patil Sainiki School,Pravaranagar)

5	The Science Association of Arts Science and Commerce College, Rahata. Organized a guest lecture on “National Science Day” for Students on 28 <sup>th</sup> February Monday 2022.	Shri. Amol Gawande Sir. CEO Smartchem Plus, Nashik.
6	Inauguration of ‘Dr. APJ Abdul Kalam Science Research Forum’ and Celebration of National Science Day- 2023.	Prof. R. S. Shinde Sir

## **28. Teaching methods adopted to improve student learning-**

- Youtube
- Power Point presentations
- Organized Workshop
- Use of Adobe Acrobat reader
- Online lectures using Zoom/Google meet Platforms.
- Remedial and Bridge Courses

## **29. Participation in Institutional Social Responsibility (ISR) and Extension activities**

Dr.T.K.Kumkar

- College Examination Officer.
- Chairman of Time Committee.
- Member of Admission Committee.
- Member of NAAC-Criteria II.
- Member of Science Association.
- Coordinator of State level Seminar.
- Centre In Charge of Madhava Mathematics Competition.
- Member of Ganesh Festival Lunch Committee.
- Chairman of Ganesh Festival Prize distribution Committee.
- Member of Administrative Committee.
- Member of Library Advisory Committee
- Member of Grievance Redressal and Antiragging Committee
- Member of RTI Committee
- Member of Student Mentoring Committee
- Member of Campus Development and Welfare Committee

### **30. SWOC analysis of the department**

#### **Strengths:**

1. Experienced and well qualified staff.
2. Computer with Internet Facility for staff and students.
3. Separate departmental library with ample number of reference books.
4. Average result of the department is 90%.
5. Certificate Course, Bridge Remedial Courses for Students

#### **Weaknesses:**

1. MoU with reputed institution for student exchange and research.
2. Publication of research papers.
3. Skill enhanced courses.

#### **Opportunities:**

1. Organization of National level Conferences.
2. Starting more skill enhanced certificate course
3. MoU with industries and academia.

#### **Threats/ Challenges:**

1. Less no. of students prefer Mathematics subject for first year.

### **31. Future plans:**

1. To Start T.Y.B. Sc. Mathematics.
  2. To Establish MOU for upgradation of department
  3. To organize National Conferences
  4. To publish research papers in high impact factor journals.
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