



1	Name of the Department	Ramanujan Institute for Advanced Study in Mathematics
2	Year of establishment	1927
3	Is the Department part of a School/Faculty of the university?	Part of School of Mathematics, Statistics and Computer Science
4	Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.)	M.Sc., M.Phil., and Ph.D in Mathematics
5	Interdisciplinary programmes and departments involved	Nil
6	Courses in collaboration with other universities, industries, foreign institutions, etc.	Nil
7	Details of programmes discontinued, if any, with reasons	Nil
8	Examination System: Annual/Semester/Trimester/Choice Based Credit System	Semester/Choice Based Credit System
9	Participation of the department in the courses offered by other departments	Department offers elective papers for P.G.Courses offered by other departments. The papers Discrete Mathematics, Graph Theory and Calculus of Variations and Integral Equations are taken by P.G. Statistics and Computer Science students. Our P.G. students in turn take elective papers offered by other departments.

10. Number of teaching posts sanctioned, filled and actual (Professors/Associate Professors/Asst. Professors/others)

	Sanctioned	Filled	Actual (including CAS & MPS)
Professor	5	4	4
Associate Professors	5	1	1
Asst. Professors	11	2	2
Others	-		

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D./ M.Phil. students guided
PremalathaKumaresan	Ph.D.	Professor	Potential Theory	32 yrs	M. Phil - 7 -
R.Sahadevan	Ph.D.	Professor	Nonlinear Differential Equations and Mathematical Physics	24 Yrs	M. Phil-8 Ph.D- 4
E.Thandapani	Ph.D.	Professor	Differential Equations	33 Yrs	M. Phil- 8 Ph.D- 7
S. Sudha	Ph.D.	Professor	Fluid Dynamics, Queuing Theory and Graph Theory	29 Yrs	M. Phil-2
G.P.Youvaraj	Ph.D.	Associate Professor	Pseudo-Analytic functions and Fourier Analysis Harmonic Mappings	18 Yrs	M. Phil -5
N.SushamaAgrawal	Ph.D.	Asst. Professor	Functional Analysis and Operator Theory	12 Yrs	M. Phil - 10 Ph.D- 1
Dr. M. Pitchaimani	Ph.D.	Asst. Professor	Population Dynamics	5 yrs	M. Phil -7
V. Thangaraj (Retired on June 2012)	Ph.D.	Professor	Probability Theory Stochastic Process	27 Yrs	M. Phil -5 Ph.D- 6

NAAC Reaccreditation - Evaluative Report
School of Mathematics, Statistics and Computer Science
Ramanujan Institute for Advanced Study in Mathematics

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D./ M.Phil. students guided
K. Parthasarathy (Retired on June 2011)	Ph.D	Professor	Harmonic Analysis Functional Analysis	34 Yrs	M.Phil -3 Ph.D-2
M. Loganathan (Retired on June 2011)	Ph.D	Professor	Theory of Semi Groups		M.Phil-4

12	List of senior Visiting Fellows, adjunct faculty, emeritus professors	Prof. Victor Anandam - Sesquicentennial Emeritus Professor
13	Percentage of classes taken by temporary faculty – programme-wise information	M.Sc. and M. Phil - 30%,
14	Programme-wise Student Teacher Ratio	M.Sc. - 80 Students - 8 teachers - 10:1 M. Phil - 10 students - 7 faculty + 2 Guest Lecturers - 10:9

15	Number of academic support staff (technical) and administrative staff:						
	S.O	A.S.O	Asst	T.O	A.T.O	Attender	Peon
Sanctioned Strength :	1	1	0	2	0	2	1
Existing Strength	0	1	0	0	0	2	0

16. Research thrust areas as recognized by major funding agencies

Algebra, Analysis and Dynamical Systems



17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise.

S. No	Title of the Project	Principal Investigator	Funding Agency	Duration of the Project
1.	Aspects of Integrable & chaotic discrete System	R. Sahadevan	CSIR - Rs. 9,25,000	01.02.2007 to 31.08.2010
2.	Global behaviour of Neutral Type Difference Equations, Applications To Physics and Mathematical Biology	E.Thandapani	UGC- Rs. 5,62,100	01.04.2007 to 31.03.2010
3.	Parameter Analysis of Gompertz Tumor Growth Model	M. Pitchaimani	DST - Rs. 9,75,360,	11.01.2012 to 10.01.2015
4.	Aging concept in Population Dynamics	M.Pitchaimani	DST - Rs.9,00,000	09.12.2005 to 31.12.2008
5.	Representations on Generalised Kac-Moody algebras	N. Sthanumoorthy (Retired Professor)	UGC - Rs.5,80,000	Feb.2007 to April 2009
6.	Ternary Semigroups and Associated structures	S.Sribala (Retd. Director & Head)	UGC- Rs.6,19,500	1.4.2008 to 31.3.2011
7.	Cellularity and Combinatorial Representations of a class of Diagram algebras	S.Parvathi (Retd. Director & Head)	UGC - Rs.8,38,800	1.4.2008 to 31.3.2011
8.	Borcherds Kac- Moody Lie Super Algebras and some applications	N. Sthanumoorthy (Retired Professor)	UGC - Rs.9,87,500	01.05.2009 to 30.04.2012
9.	Introduction to finite and infinite dimensional Lie (Super) algebras	N. Sthanumoorthy (Retired Professor)	DST - Rs.9,66,000	16.04.2013 to 15.04.2015

18. Inter-institutional collaborative projects and associated grants received

- a) National collaboration - Nil
b) International collaboration – Nil

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received.

UGC - SAP/CAS - 01.04.2009 to 31.03.2014 Sanctioned Rs.69.50 Lakhs

20. Research facility / centre with - International recognition

- state recognition
- national recognition
- international recognition

21. Special research laboratories sponsored by / created by industry or corporate bodies – Nil

22. Publications:

- * Number of papers published in peer reviewed journals (national / international)
National – 19 International – 145
- * Monographs - Nil
- * Chapters in Books - Nil
- * Edited Books - 6
- * Books with ISBN with details of publishers: Nil
- * Number listed in International Database (For *e.g.* Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.) – 145
- * Citation Index – range / average - 150-200
- * SNIP -
- * SJR -
- * Impact Factor – range / average - 1 to 1.5
- h-index – 8

23. Details of patents and income generated - Nil

24. Areas of consultancy and income generated- Nil

25. Faculty selected nationally / internationally to visit other laboratories /institutions / industries in India and abroad

R. Sahadevan

1. Visited University of JCM, Madrid, Spain, during November 18- 25, 2012
2. Visited University of Sydney, Sydney, Australia during February 9 - March 2, 2013

26. Faculty serving in

- a) National committees b) International committees c) Editorial Boards d) any other (please specify)**

R.Sahadevan

1. Editorial Board Member, Discrete Dynamics in Nature and Society, Hindwai Publishers, USA
2. Supervised Summer Research Fellow (one each for 2012 and 2013)
Sponsored by Indian Science Academy, Bangalore
3. UGC External Expert for UGC-SAP, Department of Mathematics, M.S. University, Tirunelveli
4. UGC External expert for UGC –SAP, Department of Mathematics, Osmania University , Hyderabad, Andra Pradesh.
5. UGC External Expert for UGC-SAP, Department of Mathematics, Visva Bharathi University Santhiniketan, West Bengal.
6. Mentor, DST- Inspire Programme.

E. Thandapani

1. Associate editor, Advances in Difference Equations, Springer verlag, Germany.
2. Associate editor, Far East Journal of Mathematical Sciences, India.
3. Associate editor, Malaya Journal of Mathematik, Singapore

G. P. Youvaraj

1. Advisory Committee member, The Journal of the Indian Academy of Mathematics
2. Editorial Member, Mathematics News Letter published by Ramanujan Mathematical Society.
3. Treasurer, Forum D' Analystes.
4. Mentor, Inspire Programme Department of Science & Technology.
5. Examination board member for 125th year Ramanujan Competition conducted by National Society for Technical Education.

27. Faculty recharging strategies (UGC, ASC, Refresher / orientation programs, workshops, training programs and similar programs).

The following Refresher courses were Conducted for faculty of Colleges

1. Refresher course in Mathematics on Functional Analysis,
November 14 to December 4 , 2007, Coordinator: Dr.G.P.Youvaraj
2. Refresher Course in Mathematics on Real Analysis ,
November 5-25, 2008, Coordinator- Dr. E. Thandapani
3. Refresher Course in Mathematics on Algebra,
November 5 to November 25, 2009, Coordinator: Dr. M. Loganathan
4. Refresher Course in Mathematics on Complex Analysis
November 11 to December 1, 2010, Coordinator Dr. Premalatha Kumaresan
5. Refresher Course in Mathematics on Differential Equations
November 11 to December 1, 2011, Coordinator Dr. R. Sahadevan
6. Refresher Course in Mathematics on Topology
28-09-2012 to 18-10-2012, Coordinator : Dr. Sushama Agrawal
7. Training Programme for the newly recruited Govt. College Teachers
9th July to 5th August 2009, Coordinator : Dr. E. Thandapani

28. Student projects

Percentage of students who have done in-house projects including inter-departmental projects –

All M. Phil Students work with a particular faculty and submit a dissertation.

Percentage of students doing projects in collaboration with other universities / industry / institute -

A few M.Sc. Students have done internship during summer vacation in I.I.T. wherein they do a project with a particular faculty.

29. Awards / recognitions received at the national and international level by

Faculty

R.Sahadevan – Mehanand Saha award in theoretical Science, 2007(UGC, New Delhi), - awarded in 2010

Doctoral/ Post Doctoral Fellows

C.Umamaheswari – Best Paper Presentation Award at IIT, Roorkee, 2010



30. Seminars/ Conferences/Workshops organized and the source of funding (national / international) with details of outstanding participants, if any.

(Details furnished in Appendix II)

31. Code of ethics for research followed by the departments-

UGC regulations on minimum standard and procedure for the award of M.Phil/Ph.D. degree – 2009 are followed.

32. Student profile programme-wise:

Name of the Programme (Refer to question no.4)	Applications received	Selected		Pass percentage	
		Male	Female	Male	Female
M.Sc.					
2008-2009	229	15	12	86.66	83.33
2009-2010	345	9	19	66.66	89.47
2010-2011	362	18	15	61.11	73.33
2011-2012	373	14	26	28.57	84.61
2012 - 2013	572	15	19	On going	
M. Phil					
2008-2009	196	9	10	100	80
2009-2010	192	3	7	100	85.71
2010-2011	222	3	7	100	100
2011-2012	232	1	9	100	100
2012-2013	243	7	2	On going	
Ph. D					
2008-2009	15	3	8		
2009-2010	3	1	1		
2010-2011	9	2	2		
2011-2012	16	2	6		
2012-2013	28	4	2		

33. Diversity of students

Name of the Programme (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
M.Sc.				
2008-2009 - M.Sc.	44.44	51.85	-	3.71
2009-2010 - M.Sc.	57.14	35.71	7.15	-
2010-2011 - M.Sc.	48.48	39.39	9.10	3.03
2011-2012 - M.Sc.	52.50	47.50	-	-
2012-2013 - M.Sc.	55.88	38.23	5.89	-
M. Phil				

NAAC Reaccreditation - Evaluative Report
School of Mathematics, Statistics and Computer Science
Ramanujan Institute for Advanced Study in Mathematics

Name of the Programme (refer to question no. 4)	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
2008-2009 - M. Phil	73.68	26.32	-	-
2009-2010 - M. Phil.	70	30	-	-
2010-2011 - M. Phil.	60	20	20	-
2011-2012 - M. Phil.	90	10	-	-
2012-2013 - M. Phil.	90	10	-	-
Ph.D.				
2008-2009 - Ph. D	81.82	9.09	-	9.09
2009-2010 - Ph. D	50	50	-	-
2010-2011 - Ph. D	50	25	-	25
2011-2012 - Ph. D	87.5	12.5	-	-
2012-2013 - Ph. D	50	50	-	-

34. How many students have cleared Civil Services and Defence Services

examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

Name	Category	SET	NET-JRF	NET Lecturership	NBHM	GATE
Anjan Debnath	OC	-	-	YES	-	-
E. Nandakumar	BC	YES	-	-	-	-
T. Bakkyaraj	BC	YES	YES	-	-	-
K. Manju	BC	YES	-	-	-	-
R. Lakshmi Priya	BC	YES	-	-	-	-
K. Kalaivani	BC	-	YES	-	-	-
G. Nagavigneshwari	BC	-	YES	-	-	-
N. Nathiya	BC	-	-	YES	-	-
M. Parveen Banu	BCM	-	YES	-	-	-
M. Prabavathy	MBC	YES	-	-	-	-
U. Vijayakumar	MBC	YES	YES	-	YES	-
R. Rajaji	SC	YES	-	-	-	-

35. Student progression

Student progression	Percentage against enrolled
UG to PG	Not applicable
PG to M.Phil.	50%
PG to Ph.D.	5%
Ph.D. to Post-Doctoral	-
Employed	

Student progression	Percentage against enrolled
• Campus selection	-
• Other than campus recruitment	50%
Entrepreneurs	

36. Diversity of staff

Percentage of faculty who are graduates	
of the same university	40%
from other universities within the State	20%
from universities from other States	30 %
from universities outside the country	10%

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period

Nil

38. Present details of departmental infrastructural facilities with regard to

a) Library -The Institute houses the following Libraries:

- ❖ Library of the Ramanujan Institute which contains 10,002 books
- ❖ Library of the Indian Mathematical Society

These libraries are being used by research scholars and teachers from all over the country, as they contain a good collection of important and precious volumes

b) Internet facilities for staff and students -All the Computer Laboratories, faculty rooms and administrative office have internet facility.

c) Total number of class rooms - 5

d) Class rooms with ICT facility - 1

e) Students' laboratories -There is a Computer laboratory with 35 Systems for M.Sc. and M. Phil students

f) Research laboratories - There is a Computer laboratory with 10 systems for Ph.D Scholars

39. List of doctoral, post-doctoral students and Research Associates:

a) from the host institution/university

S.NO	RESEARCH SCHOLARS NAME	DETAILS
1.	U. Vijayakumar	Full time (SMF)
2.	B. Kethesan	Full - Time
3.	M. Divya	Full – Time SMF
4.	N. Karimila Bi	Full - Time SMF
5.	G. Nagavigneswari	Full - Time CSIR
6.	E. Nandakumar	Full - Time SMF
7.	K. Kalaivani	Full - Time SMF
8.	N. Nathiya	Full - Time SMF
9.	ParveenBanu	Full - Time CSIR

10.	R. Lakshmi Lavanya	Full - Time NBHM
11.	R. Rajaji	Full - Time
12.	V. Kanniga	Full time

b) from other institutions/universities

S.NO	RESEARCH SCHOLARS NAME	DETAILS
1.	C. Monica	Full – Time SMF
2.	P. Lavanya	Full – Time Inspire
3.	T. Bhakkiaraj	Full - Time JRF
4.	B. UsnaBanu	Full - Time FIP
5.	A. Vidya	Full - Time SMF
6.	K. Manju	Full - Time SMF
7.	G. SomasundaraOri	Full Time
8.	T. Priyadharshini	Full - Time (Project)
9.	V. Muralidhar	Part – Time
10.	D. Seghar	Part - Time
11.	K. Premakumari	Part - Time
12.	S. Tamilvanan	Part - Time
13.	T. Vijayalakshmi	Part - Time
14.	N. Kavitha	Part - Time
15.	S. Padmavathy	Part - Time
16.	T.C. EswaranNambudri	Part - Time
17.	A. R. Raghavan	Part - Time
18.	R. Rema	Part - Time
19.	S. P. Rajasekar	Part - Time

40. Number of post graduate students getting financial assistance from the university. -About 75 % of Post graduate students get BC/MBC Scholarship, Merit Fellowship from the University

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.

No new programmes started

42. Does the department obtain feedback from

a. Faculty on curriculum as well as teaching-learning-evaluation?If yes, how does the department utilize the feedback?

In Choice Based Credit System the curriculum is designed by the faculty themselves.

b. Students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

Feedback from students is collected at the end of every semester and submitted to the Internal Quality Assurance Cell of the University.

c. Alumni and employers on the programmes offered and how does the

department utilize the feedback?

No.

43. List the distinguished alumni of the department (maximum 10)

1. P. Kannappan., M.Sc, M.Phil, DIG, Tamil Nadu Police
2. Dr. N. Vijayarangan, Senior Executive, TCS, Chennai
3. Prof. V. Karunakaran, Former Head, Department of Mathematics
M. K. University, Madurai
4. Dr. N. Saradha, TATA Institute of Fundamental Research, Mumbai
5. Dr. V. K. Balachandaran, Former Director and Head , RIASM
6. Dr. IqbalUnnisa, Former Director and Head , RIASM
7. Dr. P.S. Rema, Former Director and Head , RIASM
8. Dr. M.S. Rangachari, Former Director and Head , RIASM
9. Dr. S. Sribala, Former Director and Head, RIASM
10. Dr. S. Parvathi, Former Director and Head , RIASM

44. Give details of student enrichment programmes (special lectures / workshops /seminar) involving external experts.

The following programmes were conducted for P.G.Students

1. Summer Training Programme in Mathematics, July 09-28 , 2007,
Funded by Science City, Convenor : Dr. K.Parthasarathy
2. Second Summer Training Programme in Mathematics, June 1-20,2009,
Funded by Science City, Convener: Dr. R. Sahadevan.
3. Third Summer Training Programme in Mathematics, May 31 to June 19, 2010,
Funded by Science City, Convenor : Dr.M.Pitchaimani
4. Fourth Summer Training Program for P.G. Students, May 24 - June 14,
2012, Funded by Science City, Convener : G.P. Youvaraj
5. Fifth Summer Training Program for P.G. Students, May 20 - June 10,
2013, Funded by Science City, Convener : Dr.M.Pitchaimani
6. CSIR NET Coaching Classes, March, April 2011, Organized by University
Students Advisory Bureau, University of Madras
Coordinator : Dr. E. Thandapani
7. CSIR NET Coaching Classes, November – December, 2011 Organized by
University Students Advisory Bureau, University of Madras Coordinator : Dr.
Premalatha Kumaresan
8. CSIR NET Coaching Classes, May- June 2013, organized by University
Students Advisory Bureau, University of Madras
Coordinator : Dr. E. Thandapani

45. List the teaching methods adopted by the faculty for different programmes.

Apart from classroom teaching, Problem solving sessions and Seminars by students are also arranged. These are supplemented by computer aided exercises wherever possible.

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?

Wherever the faculty feels the programme objectives are not met, reasons are analyzed and the deficiencies are corrected by updating the curriculum, altering the evaluation techniques etc.

47. Highlight the participation of students and faculty in extension activities.

Students :

Our Students attend various training programmes in Mathematics conducted by IIT's, NBHM etc.

Faculty :

Faculty act as resource persons for DST Inspire Programme, conduct refresher courses, summer training programmes, NET Coaching Classes etc., and also act as resource persons for various programmes conducted by other Institutions.

48. Give details of “beyond syllabus scholarly activities” of the department.

The following Special Lectures were arranged for the benefit of Faculty, Research Scholars and M.Phil/P.G. Students

Visitor	Affiliation	Title of the talk
G.B.Folland	University of Washington, Seattle, USA	The Analysis and Geometry of Compact Heisenberg Manifolds
George Willis	University of New Castle, Australia	Almost Normal Subgroups of $SL_n(\mathbb{Z})$
B.V.Rajarama Bhat	I.S.I, Bangalore.	Hilbert Modules
R.P.Pakshirajan	Eme. Professor, University of Mysore, Mysore	Weak Convergence of Probability Measures in $D[0,1]$ space
C.V.Aravinda	T.I.F.R, Bangalore	Riemannian Geometry
A.R.Rajan	University of Kerala, Thiruvananthapuram.	Normal Categories
Aloknath Chakrabarti	Indian Institute of Science, Bangalore.	Singular Integral Equations Arising in Water Wave Problems
K.Balachaandran	Bharathiar University, Coimbatore	Controllability of Stochastic Integrodifferential Systems
Govindan Ranagarajan	Indian Institute of Science, Bangalore.	Stability of Synchronized State and its Applications
P.Kandaswamy	Bharathiar University, Coimbatore	The Dynamics of Melting Ice

NAAC Reaccreditation - Evaluative Report
School of Mathematics, Statistics and Computer Science
Ramanujan Institute for Advanced Study in Mathematics

V.P.Rathod	Gulbarga University, Karnataka	Applications of Differential Equations
S.Sundar	I.I.T. Madras, Chennai	Introduction to Topological Asymptotic Expansion and its Application to Image Filters
K.M.Tamilmani	Pondicherry University, Pondicherry	Singularities – How to Live With
V.K.Balachandran	Former Director RIASM, University of Madras	Life and Work of Euler
Gadadhar Misra	IISc, Bangalore	Operator spaces
Prof. Sathya Deo	HRI, Allahabad	On Mapping Class Groups of non- metrizable manifolds
David Mumford	Brown University, USA.	Differential Geometry of infinite dimensional spaces of shapes
Daoud Bshouti	Technion – Israel Institute of Technology, Israel.	Planar harmonic mappings and Minimal Surfaces
M. Lakshmanan	Bharathidasan University, Trichy	Integrable Systems
K.B. Athreya	Iowa State University, Ames, Iowa, U.S.A.	Last Common Ancestor
Prof. Georg Schumacher	University of Marburg, Germany	Positivity of relative canonical bundles for families of canonically polarized manifolds.
Prof. V. Balaji	Chennai Mathematical Institute, Chennai	Analogues of Narasimhan- Seshadri theorem in higher dimensions.
Prof. Goutam Bharali	Indian Institute of Science , Bangalore	The local polynomial hull around surface complex tangencies and Maslov index.
Prof. S. Viswanath	Indian Institute of science, Bangalore	Constant term identities
P.P. Phillippon	Universite Pierre et Marie Curie	Approximation of Algebraic Numbers by algebraic numbers of given degree
C. Gasbarri	Universite de Strasbourg	Geometric Transcendence theory a way to understand the similarities between arithmetic and geometry.
Dr. W. Calvert	Southern Illinois Univ.USA	Differential equations
Prof. B. Pandey	The Ohio State University at Marion, USA	Differential equations
Prof. M. Ram Murthy	Queen's University	The Tau of Ramanujan
Prof. M. Lakshmanan	Bharathidasan University, Chennai	Relevance of Mathematical Equations in Physics

NAAC Reaccreditation - Evaluative Report
School of Mathematics, Statistics and Computer Science
Ramanujan Institute for Advanced Study in Mathematics

Prof. Jesus Maris Sanz Serna	University of Valladolid, Spain	Averaging old and New
Prof. Amritanslu Prasad	Institute of Mathematical Science, Chennai	Combinatorics of permutations
Prof. P. N. Srikanth	TATA Institute of Fundamental Research, Bangalore	Some Aspects On Nonlinear Analysis and application
Prof. K. N. Raghavan	Institute of Mathematical Science, Chennai	Gelfand- Tsetlin Bases For Representation Spaces
Prof. S. Senthamarai Kannan	Chennai Mathematical Institute, Chennai	The Explicit Connection Between the standard Manomials and the MV Cycles.
Prof. Parameswaran sankaran	Institute of Mathematical Science, Chennai	The Riemann Sphere and Hop Bundles
Prof. P. Veeramani	Indian Institute of Technology Madras, Chennai	Normal Structure and Related Notions Normal Structure and Proximal Normal Structure
Prof. T. Sengadir	Department of Mathematics, Central University of Tamil Nadu	Introduction to delay differential Equations
Prof. M. Marudai	Department of Mathematics, Bharathidasan University	Generalized fixed points
Prof. S. Sundar	Department of Mathematics, Indian Institute of Tech., Chennai	PDE based Image Restoration: Modeling and Numerics
Dr. K. Selvarangan	LMS India, Engineering solutions PVT. Ltd., Chennai.	Role of Mathematics in Engineering Services
Prof. A. K .Pani	Department of Mathematics, IIT, Mumbai	Navier Stokes Equations: A Million Dollar Open Problem
Prof. E.S. Lakshminarayanan	School of Mathematics, Madurai Kamaraj University,	On Collatz $3X+1$ Conjecture
Prof. S.H. Kulkarni	Department of Mathematics IIT, Madras	The Carrier Graph Topology
Prof. M.T. Nair	Department of Mathematics, IIT, Madras	Backward Heat Conduction Problem
Prof. S. Pathi	Birla Institute of Technology, Ranchi,	A Study of Solutions of Third Order Linear Differential Equations with Constant Coefficients
Prof. Victor Anantham	IMSc, Chennai	Infinite Graphs, Nonreversible Markov Chains and potential Theory
Prof. Krishna Maddaly	IMSc, Chennai	Szego Limit Theorem on the Lattice

Prof. K. Balachandran	Department of Mathematics Bharathiar University	Controllability of Fractional Dynamical Systems
Prof. S. Thangavelu	Department of Mathematics IISc, Bangalore	Ramanujan's Master Theorem and Laguerre Expansions
Prof. G. Rangarajan	Department of Mathematics IISc, Bangalore	Detecting Connectivity Patterns in Networks
Prof. T.N.Shanmugam	Department of Mathematics Anna University	Geometric Functions in Signal Processing

Srinivasa Ramanujan's 125th birth anniversary Celebration

On the occasion of 125th birth anniversary of Srinivasa Ramanujan two Mathematics Talent Tests, one at school level and one at College Level were conducted. Nearly 600 students participated and altogether 18 winners of both competitions were awarded cash prizes and mementoes to the tune of 1.33 lakhs at a special function on 11th January, 2013. The function was presided over by Dr. Koteswara Prasad, Registrar, University of Madras and Dr. Rajeeva Karandikar, Director, Chennai Mathematical Institute was the Chief Guest.

49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details.

No

50. Briefly highlight the contributions of the department in generating newknowledge, basic or applied.

ALGEBRAIC THEORY OF SEMIGROUPS

- ❖ Regular semigroups whose division categories are Mobius categories characterized.
- ❖ An obstruction theory for non abelian extensions developed using the Matthews cohomology of ordered groupoids.

REPRESENTATION THEORY OF ALGEBRAS

- ❖ A. number of new results obtained on G-vertex colored partition algebras and Signed partition algebras.
- ❖ The RS correspondence for a large class of diagram algebras obtained .
- ❖ RS correspondence for Klein4-diagram algebras also established.

KAC - MOODY ALGEBRAS, GENERALIZED KAC - MOODY ALGEBRAS AND BORCHERDS KAC - MOODY LIE SUPERALGEBRAS.

1) KAC - MOODY ALGEBRAS:

- ❖ The principal vertex operators and super Hirota bilinear equations for a non - simply laced affine Kac - Moody algebra $C_2^{(1)}$ found out
- ❖ Homology modules, the structure of maximal ideals and the root multiplicities for two classes of extended hyperbolic Kac - Moody algebras $EHA^{(1)}_1$ and $EHA^{(2)}_2$ for all cases in general found out.

2)GENERALIZED KAC - MOODY ALGEBRAS:

- ❖ A complete classification of GKM algebras possessing special imaginary roots or possessing strictly imaginary property given
- ❖ The root- multiplicities of some generalized Kac - Moody algebras found.

3)BORCHERDS KAC - MOODY LIE SUPERALGEBRAS:

- ❖ All imaginary roots and special imaginary roots of some BKM Lie super algebras found.
- ❖ The supermultiplicities of the roots for certain Borchersds superalgebras found.
- ❖ A complete classifications of those BKM superalgebras with purely alien Imaginary property and purely imaginary property given.
- ❖ The BKM superalgebras whose purely imaginary roots are also strictly Imaginary found out(N.Sthanumoorthy, P.L.Lilly and Nazeer basha,2009).
- ❖ A complete classification of BKM Lie superalgebras possessing special imaginary roots or possessing Strictly imaginary property found.

HARMONIC ANALYSIS

- ❖ Results on relations between Synthesis in the Fourier algebra $A(G)$ of a compact group G and the Varopoulos algebra $V(G)$ obtained which subsumed earlier results of Varopoulos, Spronk - Turowska, Kaniuth - Lau and others.
- ❖ Kolmogorov's Rearrangement Problem in Fourier Analysis. studied with respect to some summability methods and Summable rearrangement problem for finite measure spaces extended to \ast finite measure spaces.

POTENTIAL THEORY

- ❖ Results analogous to those existing in classical and axiomatic potential theory were obtained in Discrete Potential theory in an infinite network including Riesz representation theorem, Domination principle and the existence of a bounded potential.
- ❖ Results on extensions and Laurent type representations of harmonic, biharmonic functions obtained. Solution to Dirichlet problem given with some restrictions.

BANACH ALGEBRAS AND OPERATOR THEORY

- ❖ Proved that if certain commutative real Banach Algebras are spectrally isometric, then they are isomorphic as algebras.
- ❖ A version of spectral theorem for a bounded normal operator on a real Hilbert space obtained.
- ❖ A version of a spectral theorem in multiplication form for an unbounded normal operator in a real Hilbert space obtained.

TERNARY SEMI-GROUPS

- ❖ A number of results on ternary semigroups, orthodox ternary semigroups, regular ternary semigroups, quotient ternary groups obtained.

RELIABILITY THEORY

- ❖ Results on Maintenance and optimal replacement policy obtained for various stochastic systems.

LIE GROUP FORMALISM: DISCRETE NONLINEAR DYNAMICAL SYSTEMS

- ❖ An analytical method has been proposed by Dr.Sahadevan's group generalizing the well known continuous transformation groups (known as Lie groups) of differential equations to differential-difference and difference equations and proved that it unifies the existing analytical techniques like for differential equations.
- ❖ A significant contribution has been made by proving that an autonomous nonlinear difference equation of arbitrary order with one or more independent variables can be transformed into a linear difference equation by a point transformation if and only if it admits a factorizable vector field whose coefficient is the product of two functions, one of the independent variable and of the dependent variable.
- ❖ This important classical result has opened up new directions in the area of nonlinear difference equations in general and exact solvability and integrability of nonlinear discrete systems in particular.
- ❖ Sahadevan's group has also devised an analytic method generalizing the well known Lie Backlund transformation group theory of differential equations to differential-difference and pure difference equations.

INTEGRABLE MAPPINGS

- ❖ A family of higher dimensional symplectic and integrable autonomous nonlinear difference equations has been discovered by Dr.Sahadevan's group which has generated a lot of interest now in the area of nonlinear discrete systems.
- ❖ A large class of higher dimensional discrete Painleve transcendental equation admitting Lax representation and special function solutions has been found. This is one of the striking results in the field of discrete nonlinear systems.
- ❖ A direct but novel method has been proposed to construct integrals for autonomous ordinary difference equations and reported several new higher dimensional integrable mappings.

- ❖ A direct method including bilinear formalism to identify integrable higher order nonlinear difference equations.

DEFORMED INTEGRABLE SOLITON EQUATIONS

- ❖ Sahadevan and his collaborators have reported several deformed solution equations with $(1 + 1)$ dimension and proved that they preserve the integrability structures such as the existence of infinitely many higher order symmetries, recursion operators, etc of the undeformed counterpart.

DIFFERENTIAL AND DIFFERENCE EQUATIONS

- ❖ The qualitative properties such as existence, uniqueness, stability and oscillation of solutions of differential and difference equations of various order and type obtained.

POPULATION DYNAMICS

- ❖ An extended Weibull /Gompertz model for the estimation of maximum human lifespan using a proper mathematical method based on survival probability pattern suggested.
- ❖ Found a tendency that survival probability is maximized in modern human survival curves.

51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

Strengths

- High quality research
- Curriculum on par with standard institutions in India and abroad
- Innovative teaching and extension activities
- Funding from UGC at SAP, CAS level, NBHM for library and other Mathematical activities, from DST for various projects.
- Recognition at international level

Opportunities

- Lectures by external experts arranged frequently for students to expose them to various topics in Mathematics
- Conferences and Workshops conducted periodically giving a good opportunity to the research scholars to interact with experts in India and abroad working in their field.
- Computer laboratory facilities with latest Mathematical software.

- Besides our own library, Indian Mathematical Society Library with its valuable collection housed in Ramanujan Institute giving opportunity for the students to look at the old volumes.
- Good employment opportunities both in teaching and corporate sector.

Challenges.

- To hold our own amidst all the well recognized mathematical institutions with in Chennai and other national institutions like IISERS and NISERS with our limited funding
- Diminishing faculty strength due to retirement
- To create a school in Number Theory
- To establish a UGC – Networking Centre in Mathematical Sciences
- To establish a Ramanujan Museum

52. Future plans of the department.

To continue quality research in Algebra, Analysis and Dynamical Systems.

- To establish a research group in Number Theory.
- To continue producing well trained post graduates in mathematics suited for research as well as employment.