

**ANNUAL REPORT 2018-2019  
DEPARTMENT OF MATHEMATICS**

**1. Introduction:**

The Department of Mathematics was established in 1959 along with the institute. It offers the M.Sc. programme in Mathematics, the M.Tech. programme in Industrial Mathematics and Scientific Computing [IMSC] and the Ph.D. programme. In addition, the department has taken the responsibility of teaching mathematics courses to B.Tech., M.Tech. (other than IMSC), M.Sc. and Ph.D. students of the institute.

**The major research areas of the department are the following:**

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| <ol style="list-style-type: none"> <li>1. Algebraic Combinatorics</li> <li>2. Algebraic Geometry</li> <li>3. Algebraic Topology</li> <li>4. Applied Probability</li> <li>5. Approximation Theory</li> <li>6. Category Theory</li> <li>7. Combinatorial Optimization</li> <li>8. Combinatorics</li> <li>9. Combinatorics of Words Equations</li> <li>10. Commutative Algebra</li> <li>11. Complex Analysis</li> <li>12. Conformal Geometry</li> <li>13. Contact and Symplectic Topology</li> <li>14. Convective Heat &amp; Mass Transfer</li> <li>15. Computational Fluid Dynamics</li> <li>16. Computational Number Theory</li> <li>17. Cryptology</li> <li>18. Differential and Integral Equations</li> <li>19. Differential Topology</li> <li>20. Fixed Point Theory</li> <li>21. Fluid Mechanics</li> <li>22. Functional Analysis</li> <li>23. Fractals</li> <li>24. Game Theory</li> <li>25. Graph Algorithms</li> </ol> | <ol style="list-style-type: none"> <li>26. Graph Theory</li> <li>27. Harmonic Analysis</li> <li>28. Inverse and Ill-Posed Problems</li> <li>29. Linear Algebra</li> <li>30. Low dimensional Topology</li> <li>31. Mathematical Modeling</li> <li>32. Mathematical Study of Ferromagnetic Networks</li> <li>33. Nonlinear Analysis</li> <li>34. Nonlinear Analysis of Functional Differential Equations</li> <li>35. Nonlinear Differential Equations</li> <li>36. Number Theory</li> <li>37. Operator Algebras</li> <li>38. Operator Equations</li> <li>39. Operator Theory</li> <li>40. Optimization</li> <li>41. Partial Differential Equations</li> <li>42. PDE Numerics</li> <li>43. Solid Mechanics</li> <li>44. Special Functions</li> <li>45. Systems and Control Theory</li> <li>46. Theory of Codes</li> <li>47. Theory of Computation</li> <li>48. Theory of Wavelets</li> <li>49. Time Frequency Analysis</li> <li>50. Wave Structure Interactions</li> </ol> |
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**2. Academic Programmes:**

**2.1 New discipline/branch introduced: -Nil-**

**2.2 New courses introduced**

**2.3 New lab(s) established: -Nil-**

**2.4 Students on roll as of September 2017+ Ph.D admission in January 2018:**

<b>Programme</b>	<b>Number of Students</b>
M.Sc.	91
M.Tech.	38
Ph.D.	102
Total	231

**2.5 Endowment prize instituted:**

Sl.No	Endowment Prize	Purpose	To be awarded from
1			

**2.6 Names of Student/Scholar who attended Conferences/ /Seminars and Symposia Abroad/India:**

**Names of Student/Scholar who attended Conferences/ /Seminars and Symposi Abroad/India:**

Sl. No.	Name of the Research Scholar	Roll No.	Name of the Conference / Seminar / Symposia/ Workshop and Venue	Date	Financial Assistant
<b>India</b>					
1	Ms. Rohini S	MA17D017	Attended International Conference on Recent Trends in Graph Theory and Combinatorics 2018 at CUSAT Kerala	26/04/2018 to 29/04/2018	Institute
2	Ms. Suchismita Mishra	MA15D008			
3	Mr. Soumitra Dey	MA15D020	Visiting his Co-gujide Prof. Hong Kun Xu Distinguished Professor, Hangzhou Dianzi Univeristy, China	01/04/2018 to 30/06/2018	Institute
4	Mr. Subhajit Chanda	MA15D022	AIS on Projective Modules at IIT Bombay	21/05/2018 to 09/06/2018	Institute
5	Mr. Subhasis Panda	MA15D028	AIS on Algebraic number theory	14/05/2018 to 20/06/2018	
6	Mr. A. Selvakumar	MA15D010	Attended aWorkshop on Symplectic, Embedding, Systolic Inequalities and Celestial Mechanics in CIMPA Research School, Daejeon, South Korea	11/6/2018 to 20/6/2018	Institute
7	Ms. Sushmita Mishra	MA15D008	Attended a NCM Workshop on Combinatorial Commulative Algebra at IIT Bombay	18/6/2018 to 23/6/2018	Institute
8	Ms. Rohini S	MA17D017			
9	Mr. Mohan Kumar Mallick		On a Research Colloboration on Nonlinear Elliptic Boundary Value problems at IIT Palakkad	21/6/2018 to 15/7/2018	Institute
10	Mr. Subhajit Chanda	MA15D022	Participated in Annual Foundation Schools – III at KSOM , Kozhikode	16/7/2018 to 28/7/2018	Institute
11	Mr. Md. Hasan Ali Biswas	MA17D011			
12	Mr. Joji Benny	MA16D025	Attended a Workshop Advanced Instructional School in Differential Topoloy at NEHU Shillong	1/7/2018 to 25/7/2018	Institute

**2.7 Names of students/scholars who won outside prizes and awards:-Nil-**

13	Dr. J.V. Ramana Reddy		Attended World Congress on Computational Mechanics – 2018 In New York USA	20/7/2018 to 31/7/2018	Institute
15	Samprita Das Roy	MA14D016	Chemnitz Symposium on Inverse problems 2018 at Germany	27/09/2018	Institute
16	Ayushi Singh Sengar	MA15D201	Course on Introduction to Stochastic Calculus at IITM Indore	15/09/2018	Institute
17	Mr. Koushik Brahma	MA18D002	Mathematics In house Symposium IC&SR Building (Auditorium Hall)	06/10/2018	Institute
18	Mr. Nirjan Biswas	MA15D017	Mathematics In house Symposium IC&SR Building (Auditorium Hall) and presented a paper titled “Embedding theorems on unbounded domain”	06/10/2018	Institute
19	Mr. Mohammad Atif	MA17D005	Mathematics In house Symposium IC&SR Building (Auditorium Hall)	06/10/2018	Institute
20	Mr. Repana Devendra	MA16D020	Mathematics In house Symposium IC&SR Building (Auditorium Hall)	06/10/2018	Institute
21	Mr. Kousik Dhara	MA14D013	International Conference on Banach Algebras, Harmonic Analysis, and Operator Theory at Department of Mathematics, Sardar Patel University, Vallabh Vidyanagar-388120, Gujarat and presented a paper titled The continuity of $(n, \mu)$ -pseudospectrum	20/11/2018	
22	Ms. Sangita Jha	MA14D017	International Conference on Recent Advances in Pure and Applied Mathematics at Delhi Technological University and presented a paper titled “Fractal Functions with Variable Scaling”	23/10/2018	Institute
23	Ms. Sushmitha	MA16D007	Lab Visit to Indian Statistical Institute, Hyderabad	5/11/2018	Institute
24	Mr. Ranjeet Kara Dharsanda		Attended International Conference on Exploring the History of Indian Mathematics at IIT Gandhinagar, Gujarat	04/12/2017 To 06/12/2017	Institute
25	Mr. Subhajit Chanda	MA15D022	Attended National Conference on Commutative Algebra and Algebraic Geometry at IISER Pune	05/12/2017 To 08/12/2017	Institute
26	Ms. Sushmitha P	MA16D007	Attended International Conference on Linear Algebra and Applications at Manipal	09/12/2017 to 16/12/2017	Institute

			Academy of Higher Education, Karnataka		
27	Mr. Arvind Kumar	MA16D012	Attended Workshop on Grobner Bases and their Applications at IIT, New Delhi	11/12/2017 to 23/12/2017	Institute
28	Mr. R. Vijayakumar	MA16D031	Attended GIAN Course on Quasi Conformal Mapping and Applications at IIT Indore	11/12/2017 to 16/12/2017	Institute
29	Mr. Sarvesh Kumar		Attended an International Meet on Function Spaces and inequalities at 83 <sup>rd</sup> Annual Conference of IMA at S.V. University Tirupati	12/12/2017 to 15/12/2017	Institute
30	Mr. Kuntal Som	MA15D019	Attended Game Theory Gurukulam at Pulavanur Village, Cuddalore	15/12/2017 to 01/01/2018	Institute
31	Ms. Arati Shashi		Attended 15 <sup>th</sup> Discussion Meeting in Harmonic Analysis at IISc Bangalore	18/12/2017 to 22/12/2017	Institute
32	Mr. Sarvesh Kumar		Attended 15 <sup>th</sup> Discussion Meeting in Harmonic Analysis at IISc Bangalore	17/12/2017 to 22/12/2017	Institute
33	Ms. Parveena Shamim A	MA17D003	Attended Meshfree Particle Methods for Solving Fluid Dynamics Problem at NIT Calicut	18/12/2017 to 22/12/2017	Institute
34	Ms. Arati Shashi		Attended National Conference in Analysis at CMI, Chennai	23/12/2017	Institute
35	Mr. Sampa Dey	MA15D005	Attended Workshop on Analytic Number Theory at ISI Kolkata	25/12/2017 to 30/12/2017	Institute
36	Ms. Rohini S	MA17D017	Attended Regional Mini Workshop on Indian Women and Mathematics at CUSAT, Cochin	02/01/2018	Institute
37	Mr. Debabrata De	<b>MA15D001</b>	Attended Quantum Groups & Non Commutative Geometry at NISER Bhubaneswar	14/01/2018 to 21/01/2018	Institute
38	Mr. Repana Devendra	MA16D020	Attended International Workshop on Recent Advances in Operator Semigroups at University of Delhi, New Delhi	17/12/2017 To 22/12/2017	Institute
39	Mr. Somnath Maity	<b>MA16D201</b>	Attended Conference on 'A Meshfree Particle Method for Solving Fluid Dynamics Problems at Nit Calicut	18/12/2017 to 22/12/2017	Institute
40	Mr. Rahul Kumar R	<b>MA15D015</b>	Attended Conference on Quantum Groups and Non Commutative Geometry at	15/01/2018 to 19/01/2018	Institute
41	Mr. Pradyut Karmakar	<b>MA16D005</b>	NISER Bhubaneshwar		

42	Mr Soumen Roy				
43	Mr. Mohan Kumar Mallick		Research Colloboration on Nonlinear Elliptic Boundary Value problems with Dr. SarathSai, Assistant Professor, Department of Mathematics, IIT Palakkad	22/01/2018 to 05/02/2018	
44	V A Kandappan	MA16D300	An Introductory course on High Performance Computing at IIT Kanpur	25/02/2019 to 01/03/2019	
45	Selvakumar A	MA15D010	NCMW - Characteristic Classes and Cobordism at IIT Bombay	04/03/2019 to 16/03/2019	

### 2.8 Name of Students/Scholars who won Institute Convocation/Institute Day Prize:

Sl.No.	Name of the Student/Scholar	Roll No.	Name of Prizes	Name of the Donor
1	Ms. Veena Sangeetha	MA13D007	Smt. Lakshmikutty Amma and Shri A. Krishnankutty Nair Prize	

### 3. Faculty and their activities:

#### 3.1. Faculty:

Name and Qualifications	Major area of specialization (only 3 areas)
<b>PROFESSORS:</b>	
Dr. A.K.B. Chand, Ph.D. (IIT Kanpur)	Fractals, Approximation Theory and Wavelets
Prof. Arindama Singh, Ph.D. (IIT Kanpur)	Logic, Numerical Analysis
Prof.S.H.Kulkarni, Ph.D. (IIT Bombay)	Functional Analysis, Numerical Analysis
Prof. S. Ponnusamy ,Ph.D. (IIT Kanpur)	Complex Analysis, Function Spaces, Special functions and Conformal Geometry
Prof. R. Radha, Ph.D. (IMSc Chennai)	Harmonic Analysis, Wavelets, Time-Frequency Analysis
Prof. R. Rama, Ph.D. (Anna University)	Formal Language & Automata Theory / Molecular computing
Prof. Y.V.S.S.Sanyasiraju, Ph.D. (IIT Madras)	Computational Fluid Dynamics

Prof. Satyajit Roy, Ph.D. (IISc Bangalore)	Convective Heat and Mass Transfer, Computational Fluid Dynamics
Prof. K.C. Sivakumar, Ph.D. (IIT Madras)	Functional Analysis, Mathematical Programming
Prof. Ch.Srinivasa Rao, Ph.D. (IISc Bangalore)	Non-linear Differential Equations
Dr. S.R. Manam, Ph.D. (IISc Bangalore)	Applied Mathematics
Prof. S. Sundar, Ph.D. (IIT Madras)	Computational Fluid Dynamics, Numerical Analysis for Partial Differential Equations, Mathematical Modeling
Prof. M.Thamban Nair, Ph.D. (IIT Bombay)	Applicable Functional Analysis: Spectral approximation, Operator equations, Inverse & Ill-posed problems.
Prof. R. Usha, Ph.D. (IIT Madras)	Fluid Dynamics
Prof. P. Veeramani, Ph.D. (IIT Bombay)	Fixed Point Theorems and their Applications to Problems in Optimization and Best Approximation, Fuzzy Set Theory
Prof. V. Vetrivel, Ph.D. (IIT Madras)	Non-Smooth Optimization, Fixed Point Theory, Complementarity problems
<b>ASSOCIATE PROFESSORS:</b>	
Dr. A.V.Jayanthan, Ph.D. (IIT Bombay)	Commutative Algebra and Algebraic Combinatorics
Dr. Kalpana Mahalingam, Ph.D. (Univ. of South Florida, Tampa)	Theory of codes, DNA Computing, Combinatorics of words
Dr. Kunal Krishna Mukherjee, Ph.D. (Texas, A&M)	Operator Algebras
Dr. Neelesh S. Upadhye, Ph.D. (IIT Bombay)	Probability Theory and applications
Dr. A.J. Shaiju, Ph.D. (IISc, Bangalore)	Game Theory, Systems and Control Theory
Dr. Shruti Dubey, Ph.D. (IIT Kanpur)	Nonlinear Analysis of Functional differential equations, Mathematical Study of Ferromagnetic systems
Dr. Sounaka Mishra, Ph.D. (ISI, Kolkata)	Discrete Mathematics, Approximation Algorithm, Combinatorial Optimization

Dr. R. Balaji, Ph.D. (IIT Madras)	Linear Algebra and Optimization
<b>ASSISTANT PROFESSORS:</b>	
Dr. P. Aprameyan, Ph.D	Analysis on symmetric spaces, representations of real Lie groups, geometric quantization.
Dr. T.V.Anoop, Ph.D.(IMSc Chennai)	Linear and Nonlinear Partial Differential Equations, Nonlinear Functional Analysis
Dr. Arijit Dey, Ph.D.	Algebraic Geometry
Dr. Dipramit Majumdar Ph.D. (Brandeis University)	Algebraic Number Theory, p-adic aspects of modular forms and Galois representations
Dr. N. Narayanan, Ph.D. (IMSC, Chennai)	Graph Theory: Graph Colouring, Structural and Extremal Graph Theory Probabilistic Combinatorics. Discrete Mathematics
Dr. Priyanka Shukla, Ph.D (JNCASR, Bangalore)	Fluid Mechanics: hydrodynamic instability; Nonlinear dynamics; Numerical PDE; Granular flows; Pattern formation
Dr. Ramesh Kasilingam, Ph.D IIT Bombay	Differential and algebraic topology and their interactions with differential geometry
Dr. Santanu Sarkar, Ph.D. (ISI, Kolkata)	Cryptology & Computational Number Theory
Dr. Sarang S.Sane, Ph.D. (TIFR, Bombay)	Commutative Algebra, Homological Algebra, Algebraic K-theory, Algebraic Geometry
Dr. Sivaraman Ambikasaran, Ph.D (Stanford Univ.)	Numerical Linear Algebra, Fast Algorithms, and Scientific Computing
Dr. Soumen Sarkar Ph.D. (ISI, Kolkata)	Algebraic Topology, Geometric Topology, Differential Geometry, Convex Geometry, K-Theory, Topological Complexity, Persistent Homology, Ring of Continuous Functions
Dr. Sriram Balasubramanian, Ph.D. (University of Florida)	Functional Analysis
Dr. Suhas Jaykumar Pandit, Ph.D. (ISI, Bangalore)	Geometric group theory and low dimensional Topology
Dr. Sumesh K. Ph.D (ISI, Bangalore)	Operator algebra
Dr. V.Uma, Ph.D. (IMSC Chennai)	Topology and Geometry of Toric Varieties and Related Spaces
Dr. T.E. VenkataBalaji, Ph.D. (CMI, Chennai)	Algebraic Geometry and Commutative Algebra
<b>INSPIRE FACULTY:</b>	
Dr. J. Jaikrishnan Ph.D (IISc Bangalore)	Complex Analysis
<b>VISITING PROFESSOR:</b>	

Dr. S.Kesavan 01.02.2016 to 31.01.2017	Partial Differential Equation- Homogenization, Isoperimetric inequality
<b>ADJUNCT PROFESSOR</b>	
Dr. S.Kesavan 01.02.2017 to till date	Partial Differential Equation- Homogenization, Isoperimetric inequality
<b>INSTITUTE PDF:</b>	
Dr. Sreelakshmi Dr. Gunasundari Dr. Swarnalatha Dr. J.V. Ramana Reddy Dr. Rajiv Kumar Dr. Tarun Kumar Chakra	

**3.2. Short-term Courses/ Workshops/ Seminars/ Symposia /Conferences organized by the faculty members:**

Sl. No.	Coordinator(s)	Title	Period
<b>Conference:</b>			
1	Dr. Ch. Srinivasa Rao and Prof. Y.V.S.S. Sanyasiraju	AICTE SPONSORED QIP SHORT TERM COURSE on " <b>Non Linear Partial Differential Equations: Theory and Numerics</b> ". The Short Term Course was attended by 35 teachers from Andhra Pradesh, Telegana and Tamil Nadu Colleges	22-27 January 2018

**3.3. Short-term Courses/ Workshops/ Seminars/ Symposia/ Conferences/ Training attended by the faculty members in Academic institutions and Public Sector Undertakings:**

Sl. No.	Name of faculty	Title	Institution	Period
<b>Workshop:</b>				
1	Prof. M. Manickam and Dr. T. E. VenkataBalaji	Workshop on Modular Theory of Elliptic Curves and Characterisation of Riemann Surfaces at the	Kerala School of Mathematics, Kozhikode	21/05/2018 To 02/06/2018
2	Dr. A V Jayanthan and Dr. Ananthnarayan Hariharan (IITB)	ATM Workshop on Combinatorial Commutative Algebra, held at	IITB	18/06/2018 To 23/06/2018



3	Dr.T.E.Venkata Balaji, jointly with M.Manickam and A.K.Vijayarajan	National Annual Foundation School – III for PhD scholars, funded by National Centre for Mathematics, IIT- Bombay, TIFR Mumbai and NBHM at	Kerala School of Mathematics, Kozhikode	02/07/2018 to 28/07/2018
4	Prof. Arindama Singh	Workshop for Teachers on Diagonalization (5 lectures)	Central Univ of T.N.	18/12/2017 to 23/12/2017
5		Workshop for Teachers on Diagonalization (5 lectures)		
6	Prof. R.Usha	AICTE Sponsored Workshop on “Nonlinear Partial Differential Equations”, Delivered 4 lectures on Nonlinear Conservation Laws	Department of Mathematics IIT MADRAS	22/1/2018 to 27/1/2018.
7	Prof. R.Usha and Prof. Matthew Juniper, Cambridge University, UK	GIAN course on “ INSTABILITY METHODS IN HYDRODYNAMICS” Department of Mathematics, IIT Madras.		18/12/2017 To 22/12/2017
8	Dr. T. E. VenkataBalaji	Video Lectures titled “The Geometry of the Real Numbers”	Swayamprabha, Govt of India	Lecture 1 – 27th March 2019, Lecture 2 – 29th March 2019

### 3.4. Special Lectures delivered by the faculty in other Institutions:

Sl. No.	Name of faculty	Topic of Lecture	Institution	Date
1	Dr. T. E. Venkata Balaji	Geometry at Infinity	RSIC Programme PSBB-IITM	16/05/2018
		24 Lectures on Modular Forms and Elliptic Curves	Kerala School of Mathematics, Kozhikode	21/05/2018 to 02/06/2018
2		24 lectures on Homology Theory	Kerala School of Mathematics, Kozhikode	July 10-28, 2018
3	Prof. Arindama Singh	Goedel's Incompleteness Theorem	SRM University	27/02/2019
4	Prof. A.K.B. Chand	Generalized Jackson Formulas and Its Zipper Fractals	Utkal University, Odisha,	01/03/2019
5		Fractal Approximations	SVNIT Surat, Gujarat	25/03/2019

### 3.5. Invited Talks/Paper Presentation at Conferences/Symposia/Workshop

Sl. No.	Name of faculty	Programme	Paper/Talk/Lectures	Date
1	Prof. Arindama Singh	Training in Mathematics, Ramanujam Institute of Mathematics, University of Mathematics	Linear Algebra (Six lectures)	16/05/2018 to 18/05/2018
2		Training programme in Mathematics, NISER Bhubaneswar	Linear Algebra (11 lectures)	22/05/2018 to 02/06/2018
3		Training in Mathematics, Ramanujam Institute of Mathematics, University of Mathematics	Linear Algebra (Six lectures)	16/05/2018 to 18/05/2018
4		Training programme in Mathematics, NISER Bhubaneswar	Linear Algebra (11 lectures)	22/05/2018 to 02/06/2018
5	Dr. A V Jayanthan	International Conference on Mathematics held at St. Thomas College, Thrissur, Kerala.	Plenary talk	29/06/2018
6	Prof. S.R. Manam	Workshop on Differential equations and its Applications"	Connections between potentials associated with water wave scattering	07/03/2019
7	Prof. .Y.V.S.S Sanyasiraju	Central University of Karnataka, Kalaburagi (Gulbarga)	invited lecture on Gridfree numerical schemes in the National Level Workshop on Current Research in Mathematical Sciences (CRMS	30/03/2019

8		Andhra University, Visakhapatnam	invited lecture on Level set and Initialization schemes for capturing moving interfaces in a grid - free environment in the International Conference on Recent Inventions and Innovations in Mathematical Sciences (ICRIIMS-2019)	01/03/2019
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### 3.6 Visit to other Institutions

S.No	Name of faculty	Programme	Venue	Date
1	Prof. V. Vetrivel	Ph.D viva-voce meeting as a Examiner	CIT Coimbatore	24/03/2018
		Ph.D viva-voce meeting as a Examiner	SRM University	06/04/2018
2		Selection Committee Meeting	IIT Tirupati	08/05/2018
3		Selection Committee Meeting	IIT Tirupati	26/05/2018 & 27/05/2018
4		DC Meeting	SRM University	22/05/2018
5		Selection Committee Meeting	IIT Palakkad	05/06/2018
6		Selection Committee Meeting	Indian Institute of Petroleum Engineering, Visakhapatnam	18/05/2018
7		Lectures on Multivariant Calculus	Anna University	28/05/2018 & 29/05/2018
8		Ph.D. Viva	Veer SurendraSai University of Technology, Sambalpur, Odisha	29/09/2018
9		Ph.D. Viva	IIT Kharagpur	23/08.2018
10		Invited Talk	KIIT Bhubaneshwar	24/09/2018 to 28/09/2018
11		DC Meeting	SRM University	15.06.2018 to 30.06.2018
12		Selction Committee Meeting	IIT Palakkad	05.06.2018
13		Faculty Development Programme	VIT Vellore	03.07.2018 & 05.07.2018
14		Ph.D. Viva	IIT Kharagpur	07.07.2018
15	Faculty Development Programme	KIIT Bhubaneshwar	10.07.2018	

16		BoS Meeting	Thiagarajar Engineering College	14.07.2018
17		Ph.D. Viva	Mar Ephraem College of Engg. & Tech.	14.07.2018
18	Prof. S. Sundar	Guest Lecture	VIT Chennai	04/04/2018
19		BoS Meeting	Mahindra E'Cole	13/04/2018
20		Ph.D. Viva Meeting	IIT BHU	08/05/2018
21		Institute Chair Committee Meeting	IIT Roorkee	09/05/2018
22		Selection Committee Meeting	IIT Tirupati	25/05/2018 & 26/05/2018
23	Dr. Shruti Dubey	DC Meeting	VIT Chennai	07/05/2018
24		DC Meeting	SRM University Chennai	27/04/2018
25	Prof. Thamban Nair	Faculty Selection Screening Committee Meeting as Chairman	IIT Palakkad	30/04/2018
26		Subject Expert for faculty selection	IIT Delhi	10/05/2018
27	Dr. T. E. VenkataBalaji	Workshop on Modular Forms , Elliptic Curves and Riemann Surfaces	Kerala School of Mathematics, Kozhikode	21/05/2018 to 02/06/2018
28		Attended Ph. D Viva-voce examination	NIT Surathkal	31/05/2018
29	Prof. Y.V.S.S Sanyasiraju	External expert member for Faculty recruitment, Department of Mathematics	SRMIST, Katanukulathur, Chennai	31/05/2018
30		External expert member for Faculty recruitment, Department of Mathematics.	VIT, Vellore,	24/05/2018
31		Expert Examiner, for PhD Synopsis meeting in the Department of Applied Mathematics and Computational Sciences	PSG College of Technology, Coimbatore	11/04/2018
32		External Examiner for PhD Viva Voce examination	JNTU Ananthapur,	04/04/2018
33	Prof. K.C. Sivakumar	Chief Guest for the Inaugural session of the Mathematical Fest "Mathema"	SRM, IST Ramapuram	02/04/2018
34		Indian Examiner for Ph.D .Thesis	IISER Trivandrum	06/04/2018
35		Member Doctoral Committee Meeting	SRM Kattankulalathur	09/04/2018
36		Member, Board of Studies, Dept. of Mathematics and Computational Sciences	Nit Surathkul	11/05/2018
37		Member of Comprehensive Viva Voce Meeting	SRM Kattankulathur	23/05/2018

38	Dr. A.K.B. Chand	Research Review Committee	Department of Mathematics, Mukesh Patel School of Technology Management & Engineering Bhakti Vedant Swami Marg, JVPD Scheme, Vile Parle (West)	03/05/2018
39		DC Meeting	SRM University, Chennai	27/09/2018
40		Faculty Recruitment	VIT, A.P	08/09/2018
41	Dr. A V Jayanthan	Research Collaboration	IIT Bombay	10.06.2018 to 17.06.2018
42	Prof. S. Sundar	PMRF (Maths) Interview	IIT Kharagpur	04.06.2018 & 05.06.2018
43		Faculty Development Programme	VIT Vellore	08.06.2018 to 10.06.2018
44		DST – SERB Review Meeting	New Delhi	21.07.2018
45		Advanced Course Meeting	Crescent University, Chennai	29/08/2018
46		Faculty Recruitment	VIT Vellore	30/08/2018
47		Invited Talk	AMET	19/09/2018
48		DST PAC Meeting	IIT Delhi	15/09/2018
49		Invited Talk	D.G. Vaishnava College, Chennai	11/09/2018
50		Ph.D. Viva	Anna University	29/09/2018
51		Faculty Selection	IIIT Thiruvananthapuram	13/10/2018
52		Faculty Selection	NIT Bhopal	26/10/2018 to 27/10/2018
53		Talk at IFCS	Central Lecture Theatre (CLT)	03/11/2018
54		Invited Talk at International Conference	SRM Easwari Engineering College, Chennai	09/11/2018
55		Faculty Recruitment	IIT Roorkee	22/11/2018
56		PAC meeting	SERB, New Delhi	02/02/2019 & 03/02/2019
57		Faculty Interview	IIT Bhilai	23/02/2019
58	Invited talk at Prof. Laxmikantham Birth Anniversary	Prof. Laxmikantham Institute of Advanced Studies in Maths, Vizag	16/03/2019	
59	Invited talk at National Conference on Differential Equation Modeling & Computation	IIT Patna	29/03/2019	
60	Invited talk at National conference on Mathematical Modeling & Computation	VIT Chennai	27/03/2019	

61	Prof. Y.V.S.S. Sanyasiraju	Expert member, Preparation of Mathematics module for the Teachers of the technical institutions,	Academic Council for National Resource centre for Mathematics, Department of Mathematics, NIT Warangal	20/09/2018
62		Local expert member, PhD Viva-Voce examination	SRM Univesrity, Chennai,	26/09/2018
63		Expert member, Faculty selection committee,	Department of Mathematics, VIT Vellore	30/09/2018
64	Prof. K.C. Sivakumar	Invited talk, Workshop on Matrix Computation and Numerical Techniques in Science and Engineering (CEP – MCNTSE).	NIT Warangal	31/10/2018
65		Ph.D. viva-voce	IIT Hyderabad	01/11/2018
66		Ph.D. viva-voce	NIT Raipur	22/11/2018
67	Dr. T E VenkataBalaji	Board of Studies Meeting	VIT Chennai Campus	28/11/2018
68	Dr. CH. SrinivasaRao	External member for Ph. D admissions	NIT Warangal	26/10/2018
69	Dr. A.K.B. Chand	Delivered Invited talk titled: Smooth Zipper Fractal Interpolation Functions at International Conference on recent advances in pure and applied mathematics (ICRAPAM 2018)	Department of Applied Mathematics, Delhi Technological University, Delhi	23/10/2018 to 25/10/2018
70	Prof. Arindama Singh	Invited Talk – ICAM2018	IIT Kharagpur	23/11/2018 to 25/11/2018
71			Central Univ of T.N.	18/12/2017 to 23/12/2017
72		Workshop for Teachers on Diagonalization (5 lectures)		
73		Incompleteness Phenomena in Arithmatic	CRTAM, National conference, Bhawanipur Educational Society, Kolkata	14/09/2018
74	Prof. R.Usha	AICTE Sponsored Workshop on “Nonlinear Partial Differential Equations”, Delivered 4 lectures on Nonlinear Conservation Laws	Department of Mathematics IIT MADRAS	22/1/2018 to 27/1/2018.

75	Prof. R.Usha and Prof. Matthew Juniper, Cambridge University, UK	GIAN course on " INSTABILITY METHODS IN HYDRODYNAMICS" Department of Mathematics, IIT Madras.		18/12/2017 To 22/12/2017
76	Prof. Y.V.S.S. Sanyasiraju	External expert member, Board of Studies for PG in Mathematics	NIT Puducherry	16/03/2019
77		External expert member, Board of Studies in Mathematics,	SRMIST, Chennai	13/02/2019
78		External expert member, faculty recruitment	VIT Vellore	24/02/2019
79		External expert member, DC committee meeting for two PhD research scholars	VIT Andhra Pradesh, Amaravathi	23/02/2019
80	Prof. Thamban Nair	Faculty Review Committee meeting	IIT Jammu	19/02/2019 and 20/02/2019
81	Prof. A.K.B. Chand	Research Review Committee,	Mukesh Patel School of Technology Management & Engineering, Mumbai	16/02/2019
82		Resource Person for UGC-DRS Programme	Utkal University, Bhubaneswar,	28/02/2019 & 01/03/2019
83		External Examiner for Ph.D. Thesis	SVNIT, Surat, Gujarat,	24/03/2019 & 25/03/2019

### 3.7. Visits abroad by faculty:

Sl. No.	Name of faculty	Country visited	Date	Purpose of visit	Funding from
1	Prof. S. Sundar	Germany	01/07/2018 to 15/07/2018	International Workshop on Mathematical Modeling of Complex Systems - Internationalization and Double Degree at Universitat Koblenz Landau,	Institute
2	Dr. Soumen Sarkar	Moscow, Russia	24/5/2018 to 1/6/2018	International Conference on 'Algebraic Topology, Combinatorics and Mathemaical Physics" and Seminar on "Toric Topology and Homotopy Theory"	Institute
3		USA	17/7/2018 to 20/07/2018	33 <sup>rd</sup> Summer Conference on Topology and its Application at Western Kentucky University, Kentucky,	Institute

4	Prof. V. Vetrivel		15/6/2018 to 30/6/2018	Joint Research Work at Hangzhou Dianzi University, Hangzhou,	Institute
5	Dr. A.K.B. Chand	Rio de Janeiro Brazil	August 1-9, 2018	Presented a paper titled "Zipper Fractal Interpolation Functions" at International Congress of Mathematicians,	Institute
6	Prof. Thamban Nair	Berlin, Germany	17/09/2018 to 24/09/2018	Weierstrass Institute for Applied Analysis and Stochastics,	Institute
7		Germany	24/09/2018 to 28/09/2018	Visit Chemnitz University of Technology, Chemnitz,	Institute
8	Dr. V. Uma	Lyon, France	29/10/2018 to 02/11/2018	Conference on Algebraic groups : Geometry, Actions and Structure,	Institute
9	Dr. A.V. Jayanthan	New Orleans, USA	1/11/2018 to 15/12/2018	Visiting the Department of Mathematics at Tulane University for Research collaboration	Institute

### 3.8 Honours and Awards obtained by faculty:

Sl. No.	Name of faculty	Name of Award	Awarded by	Date of award
<b>Awards:</b>				
1	Dr. A.K.B. Chand	Open Arm Travel Grant for ICM-2018 to visit Brazil	International Mathematical Union,	August 1-9, 2018.
2	Prof.S. Sundar	DAAD Research Ambassador Award	German Embassy, New Delhi	21st September 2018
<b>Nominations</b>				
1	Prof. S. Sundar	nominated as a DAAD Research Ambassador		2018-22
2	Prof.Satyajit Roy	Elected as Fellow of National Academy of Sciences 2018		2018
3	Prof. S. Sundar	NOMINATED AS DST – SERB PAC (MATHEMATICAL SCIENCES) MEMBERS		2018-21
4	Prof. S. Ponnusamy			
5	Prof. V. Vetrivel	NOMINATED AS DST-SERB NPDP & ECRA COMMITTEE MEMBER		2018-21
6	Prof. R. Rama	nominated as Institute Chair Professor		01/05/2018
7	Prof. R. Usha	Appointed as Professor Emeritus for period of three years		1/7/2018.
8	Prof. S.H. Kulkarni	Re-employed as Professor Emeritus for period of three years		1/8/2018 to 30/6/2019



- 3.9. Fellowships of Academies and Professional Societies:--Nil--
- 3.10 Journal Editorial Boards: Nil
- 4. Design and Development Activities:--Nil--
- 4.1. Brief and specific details of Process/Instruments/Equipment/ Software designed and developed:
- 4.2. New facilities added or major equipment procured: -Nil-
- 4.3. Patents: --Nil--
- 4.3.1 Patents filed:--Nil--
- 4.3.2 Patents awarded:--Nil--
- 5. Research and Consultancy: Nil
- 5.2 Industrial Consultancy projects: (on going & new) --Nil--
- 5.3 RBIC projects: (on going & new)-
- 5.4 Retainer Consultancy: (on going & new)--Nil--
- 5.5 Exchange programme with other Universities including Institutions/Universities under MOU; --Nil--
- 5.6 Faculty members participation with other institution under MoU:--Nil--

**Research Publications of the faculty members & research scholars:**

5.7 Books	: ..... (Total No.)
5.8 (a) Total No. of papers published in Refereed National Journals	: .....2.....
5.8.(b) Total No. of papers published in Refereed International Journals:	.....6.....
5.8.(c) Total No. of papers presentation in National Conferences	
(i) In proceedings as full paper	: .....
(ii) As abstract	: .....
5.8 (d) Total No. of papers presentation in International conferences	
(i) In proceedings as full paper	: .....
(ii) As abstract	: .....
<b>Note: Only books / papers which are published between 1.4.2017 and 31.03.2018 are to be given. Complete details to be furnished in file accompanying excel sheet.</b>	

a. In Refereed International Journals: Excel sheet

b. In Proceedings of International Conferences: Excel sheet

7. Other Activities of the Department/Centre:

Seminar talks

Sl. No.	Name of the Faculty	Title	Date
1	Dr. N. Narayanan, Department of Mathematics, IIT Madras	Combinatorial Nullstellensatz and Applications	19/04/2018
2	Dr. Manasi S. Kulkarni, Post Doctoral Fellow, Department of Mathematics, IIT Madras	DNA Computing Inspired Combinatorics on Words	12/04/2018
3	Dr. Sarang S. Sane Department of Mathematics, IIT Madras	Linear algebra over rings : unimodular rows and completability	05/04/2018
4	Dr. Srihari Sridharan IISER, Thiruvananthapuram	Random Dynamics generated by finitely many rational maps	05/07/2018
5	Prof. Sudhir R. Ghorpade (Department of Mathematics, IIT Bombay)	A Finite Field Nullstellensatz and the Number of Zeros of Polynomials over Finite Fields.	02-08-2018
6	Dr. Sumit Kumar Pandey (Department of Computer Science, Ashoka University, Sonapat, Haryana, India)	Recursive MDS Diffusion Layers	09-08-2018
7	Dr. Parameswaran Sankaran (Department of Mathematics, Institute of Mathematical Sciences, Chennai)	Quasi-isometry and rigidity	16-08-2018
8	Dr. JaikrishnanJanardhanan (Department of Mathematics, IIT Madras) \	Hyperbolicity in Complex Analysis	23-08-2018
9	Prof. Amritanshu Prasad (The Institute of Mathematical Sciences, Chennai)	Greene's Theorem for Timed Words	30-08-2018

10	Dr. Sujata Ghosh (Department of Computer Science, Indian Statistical Institute Chennai)	Games and logic: an interplay	06-09-2018
11	Dr. N. Narayanan, Department of Mathematics, IIT Madras	Combinatorial Applications Nullstellensatz and	19/04/2018
12	Dr. Manasi S. Kulkarni, Post Doctoral Fellow, Department of Mathematics, IIT Madras	DNA Computing Inspired Combinatorics on Words	12/04/2018
13	Dr. Sarang S. Sane Department of Mathematics, IIT Madras	Linear algebra over rings : unimodular rows and completability	05/04/2018
14	Dr. P. Aprameyan (Department of Mathematics, IIT Madras)	Helgason's conjecture for Riemannian symmetric spaces 20-09-2018	20-09-2018
15	Dr. Anant R. Shastri (Department of Mathematics, IIT Bombay)	On Product Norms	27-09-2018
16	Dr. Mathew C Francis Department of Computer Science, ISI Chennai	On the second neighbourhood conjecture	4/10/2018
17	Dr. Eagambaram Narayanan Formely Deputy Director General, Indian Statistical Service, Gol	Generalized Inverses of Matrices by Inversion of Complemented Matrix and its Application to Generalized Linear Model	11/10/2018
18	Dr. Jongbaek Song Department of Mathematical Sciences, Korea Advanced Institute of Science and Technology	Equivariant Cohomology of torus orbifolds	18/10/2018
19	Prof. HemaSrinivasan Department of Mathematics University of Missouri, USA	Unimodality of Hilbert Functions of Graded Artin Algebras	25/10/2018
20	Dr. PrabhaMandayam Department of Physics IIT Madras	Mutually Unbiased Bases in Finite Dimensional Hilbert Spaces	01/11/2018
21	Dr. Tanmoy Paul Department of Mathematics IIT Hyderabad	Some recent developments of Proximality in Banach Spaces	8/11/2018
22	Dr. DhruvRanganathan Department of Pure Mathematics and Mathematical Statistics, University of Cambridge	Combinatorial methods in Algebraic geometry	15/11/2018

23	Dr. ShantaLaishram Theoretical Statistics and Mathematics Unit, ISI Delhi	On a Conjecture of Erdos on Squares in ArithmeticProgresson	22/11/2018
24	Dr. Shashank Singh IISER Bhopal	Discrete Logarithm Problem and its Applications in Cryptography	29/11/2018
25	Dr. Gopalan Nair The University of Western Australia Perth, Australia	Ballot Theorem, Generalisations and Combinatorial Analysis of M/M m)/1 Queues	04/12/2017
26	Dr. Kamalakshya Mahatab Department of Mathematical Sciences Norwegian University of Science and Technology (NTNU) Trondheim, Norway	Extreme Values of the Riemann Zeta Function on the 1-Line	07/12/2017
27	Prof. RatnasinghamShivaji W.L. Giles Distinguished Professor Emeritus of Mathematics (Mississippi Sate University, H. Barton Excellence Professor and Head Department of Mathematics & Statistics, The University of North Carolina at Greensboro, USA	Uniqueness Results for Semipositione Problems	12/12/2017
28	Dr .Hira L. Koul Department of Statistics and Probability, Michigan State University , USA	Minimum Distance Model Checking in Berkson Measurement Error Models with Validation Data	20/12/2017
29	Dr. SudarshanTiwari AG Technomathematik, TU Kaiserslautern Germany	Modelling and Simulations of Interacting Particle Systems	01/01/2018
30	Dr. Lawrence Grammont University of Lyon, Institut Camille Jordan (ICJ) St-Etienne, France	Correspondence between Bayesian Estimation and Optimal Constrained Interpolation	17/01/2018
31	Professor M. Manickam Director of Kerala School of Mathematics	On Hecke Theory	18-01-2018
32	Prof. H.G. Feichtinger Faculty of Mathematics University of Vienna Austria	The Kernel Theorem for the BanachGelfand Triple ( $S_0$ , $L_2$ , $S_0'$ ) and Applications	23/01/2018
33	Professor. K. Srinivas Reddy Department of Mechanical Engineering, IIT Madras	<i>Optimization of Energy Systems for Sustainable Development</i>	25/01/2018
34	Prof. Harald Upmeier, PhilippsUniversität Marburg, Germany, and Infosys Visiting	Quantization of Symmetric Spaces and non- commutative Toeplitz $C^*$ -Algebras	07/02/2019

	Professor at Indian Institute of Science, Bangalore		
35	Dr. Sourav Sen Gupta, Nanyang Technological University	What exactly are Machines Learning?	14/02/2019
36	Dr. Anke Kalauch, Institute for Analysis, Dept. of Mathematics Technical University of Dresden, Germany	Partially ordered vector spaces: Embedding techniques and structure preserving operators	21/02/2019
37	Dr. Chester Dominic Rebeiro, CSE, IIT Madras	Side Channel Analysis on Cryptographic Ciphers: The Case of Fault-Injection Attacks	07/03/2019
38	Dr. PremLaxman Das, SETS-Society for Electronic Transaction and Security	Higher Degree Multivariate Systems and their Applications to Cryptography	14/03/2019
39	Dr. SartajUIHasan, IIT Jammu	Enumeration of certain recurrent sequences over finite fields.	21/03/2019
40	Dr. Mrinal Nandi, Department of Statistics, West Bengal State University	Selection of events under Fault detection in Wireless sensor network using model selection method	28/03/2019

Results obtained in research work (from M.S. &Ph.D thesis) of the scholar/faculty (last year sample enclosed from Director's Speech)

Inter disciplinary group achievements of the Departments.

Socially relevant activities carried out by the Department

International collaboration achievements by the Department

1. Faculty visit
2. Student visit
3. Activities initiated

Major infrastructure development made in the Department

## 5. Research and Consultancy:

### 5.3 RBIC projects: (on going & new)

Sl. No.	Name of faculty	Title	Industry
1	VETRIVEL V	Set Valued Optimization: Optimality Conditions And Algorithms	<b>MATRICS</b>
2	ARYA KUMAR BEDABRATA C	Theory Of Zipper Fractal Interpolation And Approximation	<b>MATRICS</b>
3	KUNAL KRISHNA MUKHERJEE	Noncommutative Ergodic Theory Via Joinings - Matrics	<b>MATRICS</b>
4	BALAJI R	Elliptic Matrics	<b>MATRICS</b>
5	ARIJIT DEY	Moduli Of Sheaves Over Projective Varieties	<b>MATRICS</b>
6	PONNUSAMY S	On Harmonic And Quasi conformal Mappings	<b>MATRICS</b>
7	SHAIJU A J	Evolutionary Stability In Asymmetric Games With Continuous Strategy Space	<b>MATRICS</b>

### 5.7 Exchange programme with other Universities including Institutions/Universities under MOU;

A delegation, consisting of 12 members, includes the President of the UCA, Prof. Jean-Marc Gambaudo and other Program Directors of the research and excellence programs offered by the University visited the department on 18/01/2018 . The delegation met the faculty members to discuss potential synergies along the lines of the "EUR" projects, Ecoles Universitaires de Recherche programs which covers all the fields of expertise that UCA offers. These include –

1. EUR "INnovative Concepts In Science and Engineering" INCISE
2. EUR "UCA Next Generation Life Scientists"
3. EUR "Digital Systems for Humans"
4. EUR "ELMI : Economics, Law and Management of Innovation"