

**EVALUATIVE REPORT OF THE DEPARTMENT**

**DEPARTMENT OF MATHEMATICS**

1. Name of the Department : Department of Mathematics
2. Year of establishment : 1962
3. Is the Department part of a School/Faculty of the university :  
Yes. It is a part of Faculty of Science
4. Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.):  
M.Sc. (Mathematics), Ph.D. (Mathematics), D.Sc.(Mathematics)
5. Interdisciplinary programmes and departments involved :  
M.Sc.(IT)
6. Courses in collaboration with other universities, industries, foreign institutions, etc. : Nil
7. Details of programmes discontinued, if any, with reasons :  
Not Applicable
8. Examination System: Annual/Semester/Trimester/Choice Based Credit System:  
Semester System
9. Participation of the department in the courses offered by other departments :  
M.Sc. students have to choose open electives course from other departments.

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

Designation	Sanctioned	Filled	Actual Including (CAS & MPS)
Professor	3	2	2
Associate Professor	2	1	1
Assistant Professor	4	3	3
Other			

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. students guided/ guiding for the last 5 years
Dr. R.B.S. Yadav	PhD	Professor	Relativity	41 years	01/04
Dr. M. K. Singh	PhD	Professor	Fuzzy Algebra	35 years	
Dr. S. K. Tiwari	PhD	Associate Professor	Fixed Point Theory	24 years	02/04
Dr. Sunil Suman	PhD	Assistant Professor	Topological Dynamics	24 years	02/04
Dr. Kumar Vishal	PhD	Assistant Professor	Differential Equations, Nonlinear Dynamics	07 years	Nil
Mr. Pintu	MSc	Assistant	Differential	03 years	Nil

Samanta		Professor	Equations		
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12. List of senior Visiting Fellows, adjunct faculty, emeritus professors : Nil
13. Percentage of classes taken by temporary faculty — programme-wise information: Nil
14. Programme-wise Student Teacher Ratio :  
MSc: 1:39  
PhD: 1:4
15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual :  
Administrative staffs:  
LDC-1, Peon-2, Darban-3
16. Research thrust areas as recognized by major funding agencies : None
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. : Nil
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. : Nil
20. Research facility/Centre with :
  - State recognition : Nil
  - National Recognition : Nil
  - International recognition : Nil
21. Special research laboratories sponsored by / created by industry or corporate bodies : Nil

22. Publications:

-Number of papers published in Peer revised Journals (national/international):

**Dr. R.B.S. Yadav-08**

- Application of Graph Theory in network analysis, International Journal of Mathematics and Tech., Vol. 31, March 2016, 26-27 (with S. Kumar)
- Control Statement in C language, Int. Jour. Of Computer Trends and Technology, Vol. 35 May 2016, 8-16 (with S. Kumar)
- Charged elastic fluid sphere in General Relativity, Research Review International Journal of Multidisciplinary vol. 4 Issues 05, May 2019 (UGC approved Jour.No.44945) Impact factor 5.164 (with Purushottam)
- Some Solutions for Combined Scalar and Gravitational fields, Res. Rev. Jour. 2019, vol. 4, 2307-2309 (with P. N. P. Kushwaha)
- Solutions of Einstein's field equations for gaseous sphere, Res. Rev. Journal, 2019 Vol. 4, 2300-2306 (with J. Kumar)
- Some Static Spherically Symmetric Perfect Fluid Distribution with Spin, Jour. of Adv. And Scholarly Res. in Allied Ed., 2019, Vol. 16 Issues 4, IF. 3.46(with Pankaj Kumar Sharma)
- Some exact Solutions of String Cosmology in Bianchi type ix Space time, Interdisciplinary Jour. of Contemporary Res., 2020, Vol. 7, no. 5, 59-64, IF. 2.3(with M. Kumar)
- Some Static Charged Fluid Spheres, Studies in Ind. Place Names, 2020, Vol. 40, 12250-12262, IF 5.60 (with P. N. Kushwaha)

**Dr. M. K. Singh-05**

- On Direct Product of a Fuzzy Subgroup with an Anti-fuzzy Subgroup, International Journal of Recent Technology and

Engineering (IJRTE), Volume-8, Issue-2, Page No- 1105-1111, July 2019 Impact Factor: 5.92, ELSEVIER SCOPUS by Sudipto Gayen, Manoranjan Kumar Singh & Others.

- On a Generalized notion of Anti-Fuzzy Subgroup And Some Characterizations, International Journal of Engineering and Advanced Technology (IJEAT) Volume-8, Issue-3, Page No- 385-390, 2019 Impact Factor-5.85, ELSEVIER SCOPUS by Sudipto Gayen, Manoranjan Kumar Singh & Others.
- Introduction to Plithogenic Subgroup- IGI Global USA, Chapter-8, Page No-213- 259, Neutrosophic Graph Theory and Algorithms, Book, ISSN-2327-1981, SCOPUS, November 2019 by Sudipto Gayen, Florentin Smarandache, Manoranjan Kumar Singh & Others
- The Effect of Immune Response in HCV Disease Progression- Engineering Mathematics Letters, U.S.A, ISSN 2049-9337; Page No- 01-14, 2019, by A.N.Chatterjee, Manoranjan Kumar Singh & Bikash Kumar
- On Genetic Algorithm for Solving Inventory Problem for Deteriorating Items with Shortages, CSI Communications, 2019, Vol.42,no.-11, Page No- 20-23, by Ananta Ranjan, Manoranjan Kumar Singh & A. N. Chatterjee

#### **Dr. S.K. Tiwari-22**

- Sanjay Kumar Tiwari and Himanshu Kumar Pandey: Fixed Point Theorem in S-metric Space.,Pan American Mathematical Journal Volume 31(2021), Number 1, 19 – 28. (Scopus indexed) Citation: 01
- Sanjay Kumar Tiwari & Sandip Kumar Mishra: A COMMON FIXED POINT THEOREM IN S – METRIC SPACE, Wesleyan Journal of Research, Vol.14 No 1(I) pp. 170 – 174, (S. No. 51 in UGC-CARE Reference List)
- Sanjay Kumar Tiwari and Himanshu Kumar Pandey: RATIONAL TYPE FIXED POINT THEOREM IN 2-METRIC SPACE, South East Asian J. of Mathematics and Mathematical Sciences {ISSN 0972-7752} Vol. 16,No. 3, December(2020), pp. 231-238. (S. No. 379 In UGC-CARE Reference List), Impact Factor:, Citation: 01

- Sanjay Tiwari, Abhishek Kumar and Ashish Kumar Chauhan: The Research Output of State Public Universities of Bihar: A Bibliometric Analysis, BIHAR JOURNAL OF PUBLIC ADMINISTRATION (ISSN: 0974-2735), New Series, Vol. XVII, No. 2 July - Dec., 2020 pp 700-710 (S. No. 41 In UGC-CARE Reference List of Quality Journals, Soc. Sc.)
- J.P. Singh Joorel, Abhishek Kumar, Sanjay Tiwari, Ashish Kumar Chauhan, Ramswaroop Ahirwar: Patent Trends in Higher Education of India: A Study on Indian Central Universities, Information and Communication Technology for Intelligent Systems, Proceedings of ICTIS 2020, Volume 1, Published by Springer (Smart Innovation, Systems and Technologies, Vol. 195 , ISSN 2190-3018 ; ISBN 978-981-15-7077-3.
- Shweta Brahmabhatt, Sanjay Tiwari, Devarshi Mehta and Abhishek Kumar: Learning Objects of Computer Science Discipline: An Analysis of E-PG Pathshala With UGC - Net A Study for Future Sustainability with Emerging Topics, ICT for Competitive Strategies: Proceedings of 4th International Conference on Information and Communication Technology for Competitive Strategies (ICTCS (2019)), December 13th–14th, 2019, Udaipur, India. First edition published 2020 by CRC Press (Taylor & Francis group} pp. 713 – 720
- Abhishek Kumar, Sanjay Tiwari, Ashish Kumar Chauhan and Ramswaroop Ahirwar: Impact of NIRF on research publications: A study on top 20 (ranked) Indian Universities, COLLNET Journal of Scientometrics and Information Management, Vol.13, Issue 2, (2019)pp 219 – 229, Indexed in ESCI (Web of Science), Impact Factor:
- Abhishek Kumar, J. P. Singh Joorel, Sanjay Tiwari, Ramswaroop Ahirwar: Quantitative and Qualitative Analysis of Research Outcomes: A Study of Top Engineering Institutes, SRELS Journal of Information Management, Volume 56, Issue 6, December 2019, pp. 315 – 320.. (S. No. 86 in UGC-CARE Reference List}
- Ranjan Kumar, Subhash Kumar, Sanjay K.Tiwari, “A Study of Software Reliability on Big Data Open Source Software”, Int J Syst Assur Eng Manag (2019), Vol10, Issue 2, pp: 242-250, Springer, DOI:10.1007/s13198-019-00777-x

- Ranjan Kumar, Subhash Kumar, Sanjay K. Tiwari, “A case study on R: A powerful OSS and data analysis platform”, IJAER, ISSN 0973-4562 Volume 14, Number 9 (2019) pp. 2260-2269
- Khaliq, M. Daiyan, S.K. Tiwari: Sentiment Analyze for Shura Council Members, International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9 Issue-2, December 2019. pp. 1352 – 1356
- Abhishek Kumar, Sanjay Tiwari and Pallavi.: Case Study on Vidya-Mitra (e-Learning- MHRD Initiative): A Quantitative Analysis on Multimedia Content (Video), Proceedins of 12th International CALIBER on "Library 2030: Moving towards Smart Technologies, Services and Resources", November 28 - 30, 2019, held at KIIT, Bhubneswar
- Nashwa Khair, M. Daiyan, S. K. Tiwari, M. Aftab Alam: An Associative Classification Approach Using Data Mining for Predicting Phishy Email., IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661, ISSN: 2278-8727, Vol 20, Issue 2, Ver. IV (Mar. - Apr. 2018), PP 59-63
- Sanjay Kumar Tiwari and Himanshu Kumar Pandey: A Generalized fixed point theorem in 2-metric space, International Journal of Applied Engineering Research ISSN 0973-4562, Vol. 13, Number 9 (2018) pp. 6935-6937
- Ranjan Kumar, Subhash Kumar, Sanjay K. Tiwari: Adoption of Free and Open Source Software in India, IJAER, ISSN: 0973-4562 Volume 13, Number 16 (2018) pp. 12725-12731
- Sanjay Kumar Tiwari, Chanchlesh Kumar: Some Fixed Point Results in B-Metric Spaces, International Journal of Mathematics Trends and Technology (IJMTT), Vol. 55 No.1- March 2018.pp. 42 – 47. ISSN No. 2231-5373
- Kannan P and Sanjay Kumar Tiwari: VIVO: Faculty Research Information System and Discovery, Proceedings of 11th International CALIBER ion "Re-Envisioning Role of Libraries: Transforming Scholarly Communication." ISBN No. -978-93-81232-07-1, August 02 – 04, 2017 held at Anna University, Chennai, Tamil Nadu-600025.
- India ranking 2016: Ranking model for Indian higher educational institutions, 2016 International Conference on ICT in Business

Industry & Government (ICTBIG), year 2016 Pages 1-6, DOI: 10.1109/ICTBIG, 2016, 7892716, IEEE Conference Publications

- Ranjan Kumar, Subhash Kumar, Sanjay K. Tiwari, “FREE AND OPEN SOURCE SOFTWARE: A KEY ENABLER FOR DIGITAL INDIA”, SAJMS, ISSN 2395-1079, Vol 3, No 5, June 2017, pp 11-15
- Sanjay Kumar Tiwari and Rekha Kumari: Fixed Point Theorems in 2- metric space for non continuous map, International Journal Of Advanced Research in Engineering & Management (IJAREM), Vol. 02, Issue 01, 2016.
- Some fixed point results in ultra metric spaces: Some fixed point results in ultra metric spaces, European Academic Research, Vol.- IV, Issue – 2 , May, 2016, Impact Factor: 3.4546 (UIF)
- Sanjay Kumar Tiwari, Chanchlesh Kumar: Fixed Point Theorems For Generalized Contraction In Ultra Metric Spaces, IOSR Journal of Mathematics (IOSR-JM), Vol 12, Issue 3 Ver. III (May. - Jun. 2016), e-ISSN No. 2278-5728

#### **Dr. Sunil Suman-01**

- Vinay Kumar Chaudhary and Sunil Suman: An exact analytical solution of Einstein’s field equations for anisotropic fluid sphere, Research review international journal of multidisciplinary, ISSN: 2455-3085, (2018), Vol 03, Issue 08

#### **Dr. Kumar Vishal-03**

- On dynamics, existence of chaos, control and synchronization of novel complex chaotic system, K. Vishal and S.K. Agrawal, Chinese Journal of Physics, ISSN: 0577-9073, (2017), 55, 519-532, (Impact Factor: 2.638) (Citation-30)
- Existence of Chaos, dynamical behaviour with fractional order derivatives and modified adaptive function projective synchronization with uncertain parameters of a chaotic system, S.K. Agrawal and K. Vishal, Optik, ISSN: 0030-4026, (2017), 131, 89-103, (Impact Factor: 2.187) (Citation-03)
- Hyperchaos control and adaptive synchronization with uncertain parameters for fractional order Mathieu-Van der Pol systems, K Vishal, S K Agrawal and S Das, Pramana - Journal of Physics,



ISSN: 0304-4289, (2016), 86, 59-75, (Impact factor: 1.688)  
(Citation-11)

**Mr. Pintu Samanta-01**

- Samanta, P., Rao, C.S., Existence and Uniqueness of a Non-Negative Monotonic Solution of a Nonlinear Ordinary Differential Equation, Differ. Equ. Dyn. Syst. (2019), <https://doi.org/10.1007/s12591-019-00483-x>
- Monograph :
- Chapter in Book :
- Edited Books :
- Books with ISBN with details of publishers :
- Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database International Social Sciences Directory, EBSCO host, etc.):
- Citation Index — range / average :
- SNIP :
- SJR :
- Impact Factor — range / average :
- h-index :

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 : Nil

26. Faculty serving in a) National committees b) International committees c) Editorial Boards d) any other (please specify) : Nil

27. Faculties are members of different state level committees and editorial board. Faculty recharging strategies (UGC, ASC, Refresher I orientation programs, workshops, training programs and similar programs):

Teachers are encouraged to participate in various workshops, orientation programmes and Refresher Courses organized by other universities/UGC-Hrdcs

28. Student projects :

- Percentage of students who have done in-house projects including inter- departmental projects: Nil
- Percentage of students doing projects in collaboration with universities /industry / institute : Nil

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

- Faculty :
- Doctoral/post-doctoral fellows :
- Students :

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

- International Conference on “Recent Advances in Mathematics and Scientific Computing” during September 18-19, 2018 (Funded by Magadh University, UGC and SCRS)
- National Seminar on “Application of Technical Terms in Research and Teaching in Computer Science and Mathematics”, during September 18-19, 2018 (Funded by CSTT, Ministry of H.R.D., New Delhi).
- National Seminar on “Cloud Computing, Big Data Analytics & Mathematical Applications” during June 04-05, 2017 (with the technical support from CSI Patna Chapter).

31. Code of ethics for research followed by the departments: As per University rules and regulations

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.(Mathematics)	2015-17	356	87	29		
	2016-18	489	90	26		
	2017-19	320	94	22		
	2018-20		87	29		
	2019-21	7418	72	38		
Ph.D. (Mathematics)	2016		10	1		
	2020		18	4		

33. Diversity of students:

Name of the Programme (refer to question no. 4)	No. of students from the same university	No. of students from other universities within the State	No. of students from other universities outside the State	No. of students from other countries

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34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations?

Give details category-wise. :

S.No.	Name	Session	Achievements	Air	Category
1	Sanjeet Kumar	2014-16	CSIR-JRF	153	BC-II

35. Student progression:

Student progression	Percentage against enrolled
U.G. to P.G.	
P.G. to M.Phil	
P.G. to Ph. D.	
Ph. D. to Post-Doctoral	
Employed <ul style="list-style-type: none"><li>• Campus Selection</li><li>• Other than campus requirement</li></ul>	
Entrepreneurs	

36. Diversity of staff:

Percentage of faculty who are graduates	
of the same university	03

from other universities within the State	NIL
from universities from other States	03
from universities outside the country	NIL

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 : Yes

b) Internet facilities for staff and students. : Yes

c) Total number of class rooms : 04

d) Class rooms with ICT facility : Nil

e) Students' laboratories : One computer Lab

f) Research laboratories : Nil

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

40. Number of post graduate students getting financial university. :  
University provides exemption of tuition fees to the PG girl students.  
Other financial assistance as per the university rules.

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

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?
  - b. Students on staff curriculum and teaching learning-evaluation and. how does the department utilize the feedback. ?
  - c. Alumni and employers on the programmes offered and how does the department utilize the feedback. ?
43. List the distinguished alumni of the department (maximum 10):
- Sri Nawal Kumar Singh, DIG
- Dr. Sawal Kishore Singh, Professor, NIT Patna
- Dr. Ramayan Singh, Professor, NIT Jamshedpur
- Dr. Thakur C K Raman, Prof & Head, Kolhan University, Chaibasa
- Dr. Jawahar Singh, Principal, S.U. College, Hilsa
- Dr. Bijendra Kumar, Prof & Head, T.M.B.U., Bhagalpur
- Dr. Alok Kumar, Professor, V.K.S.U., Ara
- Sri Shyam Mohan Singh, SDO
44. Give details of student enrichment programmes (special lectures/ workshops / seminar) involving external experts. : Few extra mural lectures were organized in the department where experts from IITs, NITs gave lectures.
45. List the teaching methods adopted by the faculty for different programmes. :

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

Through continuous evaluation of students in the form of class tests and assignments

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

Students participate in University Annual cultural programme (Tarang) and Annual sports programme (Eklavya). Faculties and students participate in the conference and seminars.

48. Give details of "beyond syllabus scholarly activities" of the department:

Students are encouraged to appear in the competitive exams such as NET/GATE etc. The department has also organized free classes for the preparation of NET/GATE exams.

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 new knowledge, basic or applied.

The learner centric approach is ensured through assignments, project works etc. Faculty members are having publications in journals of repute. Students are getting trained for the research while doing projects as a part of their M.Sc. programme.

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

Strengths:

The Department is having 6 faculties and the research is going on in different areas in both Pure and Applied Mathematics.

**Weaknesses:**

No access to Research Journals/e-journals, need of software (MATLAB/Mathematica etc), up gradation of Software in Computer Laboratory in the Department

**Opportunities:**

**Challenges:** Getting funding from agencies, Collaboration with the industries and placements of students

**52. Future plan of the Departments. :**

The department has the following plans for future development

- Developing Innovative lab and facilities for research
- To get funds from several agency viz. DST, NBHM, CSIR, UGC etc
- To introduce a Degree/Diploma course in Industrial Mathematics/Data Science
- To organize outreach programmes in Mathematics