National Institute of Technology, Jamshedpur
(Department of Mathematics)

1. Name: Dr. Hari Shankar Prasad

2. Designation: Assistant Professor

3. Date of Joining the institute: 08-05-1996

4. Qualification:

    (i)   Ph. D. (Mathematics) from N.I.T. Warangal, (A.P), India in 2012.

    (ii)   M. Sc. (Mathematics) from University Department, B.B.A.B.U. Muzaffarpur, Bihar in 1993.

5. Present Postal Address:

    Department of Mathematics, N.I.T. Jamshedpur
    P.O.- N.I.T. Jamshedpur, Jharkhand, India. Pin-Code: 831014

6. E-mail address and contact No.:

    hsprasad.math@nitjsr.ac.in, 9470320842, 6203724557

7. Characteristics:

    Positive Attitude, Self-dependent, Non-involvement in any Unethical work.

8. Area of Research interest:

- Numerical Analysis/Methods
- Differential equations, Integral equations, Integro-Differential equations
- Singular Perturbation Problems
- Numerical/Analytical methods for ordinary/ partial/delay differential equations
- Numerical/Analytical methods for Singularly Perturbed ordinary/ partial/delay differential equations
- Numerical methods for Singularly Perturbed Integro-differential equations

9. **Ph.D. Research Scholars under supervision:**

   (i)   **Md. Javed Alam** (Registration No.: 2014RSMA002 dated 05 /01/2015)
         Title of research: Numerical Solution of singular perturbation problems
   (ii) **Rakesh Ranjan** (Registration No.:2015RSMA003 dated 03/08/2015)
         Title of research: Numerical Treatment of Singular Perturbation Problems.
   (iii) **Ram Pratap Chauhan**: (Registration No: 2018RSMA003 dated 16/07/2018)

10. **M.Sc. Project thesis work supervised:**

   (i)   **Pratima Tiwari (Reg. No.-2015PGMHMH01)**: A survey of numerical techniques for solving Singularly Perturbed Partial Differential Equations and solution of two-point boundary value problems using differential quadrature methods.

   (ii) **Tejaswini Kumari (Reg. No.-2015PGMHMH03):** Survey of recently developed Numerical methods and application of differential quadrature method for solving Singularly Perturbed two-point boundary value problems.

   (iii) **Shivanki (Reg. No.-2016PGMHMH06):** Numerical Solution of Singularly Perturbed Boundary Value Problems having twin layers.

   (iv) **Shivani (Reg. No.-2016PGMHMH010):** Numerical Solution of Singularly Perturbed General Differential-Difference Equations with mixed shifts using fitted cubic spline method.

   (v)   **Diksha Dumka (Reg. No.-2016PGMHMH023):** Exponentially fitted fourth order finite difference method for the solution of Singularly Perturbed Second Order Boundary Value Problems .

   (vi) **Kumari Sujata Sardar (Reg. No.-2017PGMHMH06)**: Numerical integration of Singularly Perturbed Differential Equations

   (vii) **Susmita Behera (Roll No.- 2018PGMHMH02):** Numerical Solution of Boundary Value Problems for Singularly Perturbed Differential-Difference Equations.

(viii) **Arpita Mohanty (Reg. No.-2018PGMHMH12):** Numerical Treatment of Singularly Perturbed Delay Differential Equations.

(ix) **Sonali Vishal (REGISTRATION NO. : 2019PGMHMH04):** A SURVEY OF NUMERICAL METHODS FOR SINGULARLY PERTURBED PROBLEMS IN DELAY DIFFERENTIAL EQUATIONS.

(x) **Tinu Deshwal (Reg. No.-2019PGMHMH01):** A SURVEY OF NUMERICAL METHODS FOR SINGULARLY PERTURBED BOUNDARY VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS.

11. **Research Contribution:**

(i) **Ranjan, R., Prasad, H.S.,** A novel approach for the numerical approximation to the solution of singularly perturbed differential-difference equations with small shifts. *J. Appl. Math. Comput. 65, 403–427 (2021). https://doi.org/10.1007/s12190-020-01397-6.* **[SCIE].**

(ii) **Rakesh Ranjan and Hari Shankar Prasad:** A Fitted Finite Difference Scheme for solving Singularly Perturbed Two Point Boundary Value Problems, *Information Sciences Letters,* ISSN 2090-9551 (Print), ISSN 2090-956X (Online) vol:9, issue:1, pp:65-73 (2020), *(SCOPUS).*

(iii) **Rakesh Ranjan, H. S. Prasad:** An exponentially fitted scheme for solving singularly perturbed delay problems - *Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics, 40 (1), 1-15 (2020),* ISSN : 2617-7900 (Online) vol:40(1) pp:1-15 (2020), *(SCOPUS).*

(iv) **R. Ranjan, H.S. Prasad, MD. J. Alam** : A Fitted Numerical Method for a Class of Singularly Perturbed Convection Delayed Dominated Diffusion Equation, *Applied Mathematics and Computational Intelligence, (2020),* ISSN : 2289-1315, vol:9, pp:21-38.

(v) **Rakesh Ranjan, H. S. Prasad:** An Efficient Method of Numerical Integration for a Class of Singularly Perturbed Two Point Boundary Value Problems, *WSEAS TRANSACTIONS on MATHEMATICS,* ISSN : 2224-2880 vol:17 pp:265-273, , 2018. *(SCOPUS)*

(vi) **MD. J. Alam, H.S. Prasad, R. Ranjan**: A New Exponentially Fitted Numerical Integration Scheme for Solving Singularly Perturbed Two Point Boundary Value Problems, *WSEAS TRANSACTIONS on MATHEMATICS,* ISSN: 2224-2880, vol:19, pp:610-618, 2020. *(SCOPUS).*

(vii) **MD. J. Alam, H.S. Prasad, R.Ranjan**: AN EXPONENTIALLY FITTED INTEGRATION SCHEME FOR A CLASS OF QUASILINEAR SINGULAR PERTURBATION PROBLEMS, *J. Math. Comput. Sci. 11,* ISSN: 1927-5307 vol:11 issue:3 pp:3052-3066, *(2021). (SCOPUS)*

(viii) **H.S. Prasad, Y. N. Reddy**: Numerical Solution of Singularly Perturbed Two-Point Singular Boundary Value Problems Using Differential Quadrature Method - *American Journal of Numerical Analysis, 2014, Vol. 2, No. 6, 177-183, DOI:10.12691/ajna-2-6-2* vol:2 pp:177-183

(ix) **H. S. Prasad, Y. N. Reddy**: Differential quadrature method for singularly perturbed differential difference equations with small delay in convection term, *International Journal of Mathematical Sciences, Technology and Humanities 2 (2015) Vol. 5, Iss. 1, pp: 6 - 25.* ISSN : 2249 5460 vol:5 issue:1 pp:6-25

(x) **H. S. Prasad, Y. N. Reddy**: Numerical treatment of singularly perturbed two-point boundary value problems with mixed condition using Differential Quadrature Method, *International Journal of Applied Science and Engineering, 2011. 9, 3: 207-221,* ISSN : 1727-2394 vol:9 issue:3 pp:143-160

(xi) **H.S. Prasad, Y. N. Reddy**: Numerical solution of singularly perturbed differential-difference equations with small shifts of mixed type by Differential Quadrature Method. - *American Journal of Computational and Applied Mathematics, 2012, 2(1): 46-52, DOI: 10.5923/j.ajcam.20120201.09.* vol:2 issue:1, pp:46-52

(xii) **H.S. Prasad, Y. N. Reddy**: A Fifth Order Compact Difference Method for Singularly Perturbed Singular Boundary Value Problems, *American Journal of Applied Mathematics and Statistics, vol. 3, no. 2 (2015): 49-53. doi: 10.12691/ajams-3-2-1.* vol:3 pp:49-53

(xiii) **H.S. Prasad, Y. N. Reddy:** Differential Quadrature Method for the general singular perturbation problems, *Int. J. of Mathematical Sciences and Applications, Vol. 1, No. 2, May 2011* vol:1 issue:2 pp:975-999

(xiv) **H.S. Prasad,_ Y. N. Reddy**: Initial value technique for singularly perturbed two-point boundary value problems using Differential Quadrature Method, *International J. of Math. Sci. & Engg. Appls. (IJMSEA) ISSN 0973-9424, Vol. 5 No. IV (July, 2011), pp. 407-431.*

(xv) **H.S. Prasad, Y. N. Reddy**: A Fitted Second Order Finite Difference Method for Singular Perturbation Problems Exhibiting Dual Layers, *American Journal of Numerical Analysis, vol. 2, no. 6(2014): 184-189, DOI:10.12691/ajna-2-6-3* vol:2 pp:184-189

(xvi) **H.S. Prasad, K. Phanindra, Y. N. Reddy:** Fitted Van Veldhuizen finite difference method for singular perturbation problems with layer behaviour, *Intl e-Journal of Maths and Engg, 153, (2012), pp-1399-1410.*

12. **Research Paper's under review in SCI/SCOPUS Journals: Five (05)**

13. **Short Term Training Programme Conducted/Organised:**
    Short Term Training Programme (STTP) of Five (5) days duration on "Numerical Methods and its Application in Science and Engineering" during the period from 19-08-2013 to 23-08-2013.

14. **Invited Lecture Delivered:**
    An invited lecture delivered on "Capriciousness of some standard numerical methods: Singular Perturbation Problems" in the forenoon session on 10th October, 2018 in a one-week Short Term Training Programme (STTP) on "Mathematical Modelling and Numerical Techniques in Engineering and Science" held during 9th to 13th October, 2018, organised by the Department of Mathematics, NIT Warangal, A.P., India.

15. Conference Attended/Paper Presented/Published:

S. No	Authors Name	Year	Title of Paper	Name of Conference	Organising Institute	Date	Volume	Page No.
				Details				
1	H. S. Prasad, Y. N. Reddy	2012	Numerical solution of singular singularly perturbed two point boundary value problems using Differential Quadrature Method.	*Conference on New Vistas in Computational Fluid Dynamics in Engineering.*	Department of Mathematics, NIT Warangal.	27-01-2012 to 29-01-2012		
2	H. S. Prasad, Y. N. Reddy	2011	Numerical Treatment of Singularly Perturbed Two-Point Boundary Value Problems With Mixed Condition Using Differential Quadrature Method.	*National Meet of Research Scholars in Mathematical Sciences.*	Department of Mathematics. IIT Kharagpur.	12-10-2011 to 15-10-2011	9, (I JASE)	*143-160*
3	Y. N. Reddy, H. S. Prasad, K. Phanindra	2011	Fitted Van Veldhuizen finite difference method for singular perturbation	56th Congress of Indian Society of Theoretical and Applied Mechanics(ISTAM-2011)	Department of Applied Mathematics and Humanities, S.V. N.I.T., Surat, India	19-12-2011 to 21-12-2011		

			problems with layer behaviour.					
4	Y. N. Reddy, H. S. Prasad	2011	Differential Quadrature Method for the Singular Perturbation Problems	55th Congress of Indian Society of Theoretical and Applied Mechanics(ISTAM-2010)	Department of Mathematics, N.I.T. Hamirpur(H.P), India	18-12-2010 to 21-12-2010	1, (IJMSA)	975-999
5	MD. Javed Alam, H. S. Prasad and Rakesh Ranjan	2021	*A Three Point Integration Scheme For Singular Perturbation Problems*	*2nd INTERNATIONAL BAKU CONFERENCE ON SCIENTIFIC RESEARCH*	*Baku, AZERBAIJAN.*	*April 28-30, 2021*		

16. Seminar/Summer/Winter School/ Short Term Courses Attended

Sr. No.	Name of the Courses	Place & Sponsored by	Dates
1	Adam completion & co-completion.	Department of Mathematics, R.E.C. Rourkela, Orisa AICTE / ISTE, New Delhi	From 18-12-99 to 31-12-99
2	Teacher's role in engineering education.	Department of Mechanical Engineering, R.I.T. Jamshedpur. AICTE / ISTE, New Delhi	From 25-12-2000 to 13-01-2001
3	Energy Technologies & Management – Sustainable Perspective.	Department of Mechanical Engineering, B.I.T. Mesra, Ranchi	From 18-06-2001 to 30-06-2001

		(Jharkhand). AICTE / ISTE, New Delhi	
4	Geomining applications in mining and allied areas	Department of Geology & mining Engineering, B.I.T. Sindri, P. O – Sindri Institute, Dhanbad. AICTE / ISTE, New Delhi	From 29 -10 - 2001 to 10 - 11 - 2001
5	National seminar on Advances in Mathematical, statistical and Computational methods in Science and Technology	Department of Applied Mathematics, Indian School of Mines, DHANBAD – 826004.	From 29 -11- 2001 to 30-11- 2001
6	Some aspects of modelling and Simulation electrical systems.	Department of Electrical Engineering, R.I.T. Jamshedpur. AICTE / ISTE, New Delhi	From24 -12 - 2001 to 06 - 01 - 2002
7	Tribology, Engine Technology and Fuel Economy	Department of Production Engineering & Management, N.I.T. Jamshedpur. AICTE / ISTE, New Delhi	From15 -03 - 2004 to 26 - 03 - 2004
8	Fundamentals of Numerical Computing	Department of Mathematics, I.I.T. Guwahati. QIP	From 06-06- 2005 to 10-06-2005
9	Faculty Training Programme on Finite Element Method and its Application	N.I.T. Jamshedpur. TEQIP	From 27-06- 2005 to 08-07-2005
10	Continuing Education Programme on Interpersonal Effectiveness(Level II)	I.I.T Kharagpur	From 10-07- 2006 to 14-07-2006

11	Numerical Methods	Department of Mathematics, N.I.T. Jamshedpur. TEQIP	From 26 -12 - 2006 to 31 - 12 - 2006
12	Worksop on Human Resources Training : Challenges and Opportunities	Department of Humanities, N.I.T. Jamshedpur. TEQIP	From 09 -02 - 2008 to 10 - 02 - 2008
13	One day seminar on "Challenges in Current Mathematics Research"	Department of Mathematics, N.I,T. Warangal, India	On 22-10-2010
14	National Workshop on " Advanced Computational Applications Using Ansys Fluent"	Department of Mathematics, N.I,T. Warangal, India	On 07-01-2011
15	STTP on "Mathematical Modelling &Numerical Techniques(MMNT)"	Department of Mathematics, N.I,T. Warangal, India	From 17 -01 - 2011 to 21 - 01 - 2011

13. **Additional responsibility:**

(a) **Dept./Centre's Level:**

(i) Departmental Faculty Advisor, Ph. D scholar, All Batch

(ii) Departmental Time Table and Course distribution in charge

(iii) Member house allotment committee

(iv) Member of Departmental purchase committee.

(v) Member of Departmental Coordination committee. Through Ref. No.:

NITJSR/R/75/2012 Dated 12-12-2012.

(b) **Institute Level:**

1. Assistant Warden, Hall – D (From 26-11-2001 to 17-01-2005)

2 Library committee member): Ref. No.: NITJSR/R/

3 Departmental Purchase Committee(member), Ref. No.: NITJSR/R/75/2012 Dated 12-12-2012

4   Member Stock Verification Committee

14. **Courses Currently Being Taught:**

(a) **U. G [B.Tech.(H)] Courses:** Engineering Mathematics- I

(b) **Regular P.G Courses**:

- **M. Sc (Math) courses:** Numerical Analysis, Ordinary Differential Equations, Numerical Solution of Ordinary and Partial Differential Equations
- **MCA Courses:** Numerical Methods

15. **Courses Taught:**

(c) **U. G [B.Tech.(H)] Courses:** Engineering Mathematics- I, Engineering Mathematics- II, Engineering Mathematics- III, Engineering Mathematics- IV, Numerical methods and Computational Techniques.

(d) **Continuing Education Programme(CEP) Courses**: Professional Mathematics, Engg. Mathematics-I, Engg. Mathematics-II.

(e) **Part time/Regular M.Tech./P.G Courses:** (i) Engineering Analysis (ii) Mathematical Methods in Engineering(MMIE), MMIE-LAB.

(f) **Regular P.G Courses**:

- M. Sc (Math) courses: Numerical Analysis, Ordinary Differential Equations
- MCA Courses: Computer oriented numerical techniques/Numerical Methods
- M. Sc (Math) courses: Numerical Solution of Ordinary and Partial Differential Equations

Date: 20-07-2021   (Hari Shankar Prasad)

Department of Mathematics, N.I,T. Jamshedpur