

# Dr. J. JAYAKUMAR

## Brief Resume

### Personal Data

Date of Birth and Sex	:	June 3, 1966	Male
Present Designation	:	Professor & Head	
Department	:	Department of Mathematics	
Date of entering service in PEC	:	23-07-1996	
Working in PEC for	:	25 years (from 23.7.1996 to till date)	

### Education

Degree	Institution / University	Year of Pass	Class
<b>B.Sc.</b>	Bishop Heber College / Bharathidasan University, Tiruchirapalli	1986	First
<b>M.Sc.</b>	Bishop Heber College / Bharathidasan University, Tiruchirapalli	1988	First
<b>M.Phil.</b>	Bharathidasan University, Tiruchirapalli	1990	First
<b>Ph.D.</b>	Bharathidasan University, Tiruchirapalli	Jan 1996	Commended

### Research Interest

- Numerical solution of differential equations, nonlinear equations and their error analysis.

### Research Fellowships

- Bharathidasan University - Junior Research Fellowship - Jan1990 to Dec 1992(3 years)
- CSIR, New Delhi - Senior Research Fellowship –Jan 1993 to Dec 1995 (2 years)

### Professional Experience: (Total 25 years)

- 23.7.1996 to 22.7.2000 (4 years) **Lecturer**, Mathematics, PEC, Pondicherry
- 23.7.2000 to 22.7.2003 (3 years) **Senior Lecturer**, Mathematics, PEC, Pondicherry
- 23.7.2003 to 22.7.2006 (3 years) **Assistant Professor**, Mathematics, PEC, Pondicherry
- 23.7.2006 to 19.2.2016 (9.5 years) **Associate Professor**, Mathematics, PEC, Pondicherry
- 20.2.2016 to till date (5.5 years), **Professor** Mathematics, PEC, Pondicherry
- 24.9.2012 to 28.2.2014 & 8.10.2019 to till date **HOD**, Mathematics, PEC, Pondicherry

### Subjects Taught

- All Engineering Mathematics subjects (Mathematics I, II, III, IV)
- Numerical Methods (B. Tech. Civil, Chemical, EIE and ECE)
- Mathematics for Computer Science (B.Tech. CSE and IT)
- Mathematical Foundation for Computer Science for MCA – PG Degree
- Advanced Mathematics for M.Tech. EIE, EEE – Post Graduate Degree

### Collaborative Research (Short-term visit)

Completed a “**Short-term visit to Institution within India**” for a **period of 45 days** during 21.11.2004 to 5.01.2005 and did **collaborative research** with Dr. S. Natesan, Professor, Department of Mathematics, I.I.T., Guwahati, India, under a project funded by the **National Board for Higher Mathematics**, DAE, Mumbai, India. Value of the **grant received is Rs.50000**.

**Ph.D. Guidance:** Awarded: 2                      Progress: 1

No.	Name of the student	Name of the University	Full/Part time	Status
1	Kalyanasundaram M	Pondicherry University	Full time	Degree awarded in January 2017
2	Parimala S	Pondicherry University	Full time	Degree awarded in January 2020
3	Jinny Ann John	Pondicherry University	Full time	In Progress

### **International Journal Publications:**

**Total: 27    SCI: 6;   SCIE: 2;   ESCI : 3;   Scopus: 11**

[1] **J. Jayakumar**, N Ramanujam, A Computational method for solving singular perturbation problems, Applied Mathematics and Computation, pp. 31-48, 55, 1993, **Elsevier, ISSN 0096-3003, SCI indexed.**

[2] **J. Jayakumar**, N Ramanujam, A numerical method for singular perturbation problems arising in chemical reactor theory, Computers & Mathematics with Application, pp. 83-99, 27(5), 1994 **Elsevier, ISSN 0898-1221, SCI indexed.**

[3] **J. Jayakumar**, N Ramanujam, A Computational method for solving quasi-linear singular perturbation problems, Applied Mathematics and Computation, pp. 1-14, 71, 1995, Elsevier, **ISSN 0096-3003, SCI indexed.**

[4] **J. Jayakumar**, Improvement of numerical solution by boundary value technique for singularly perturbed one dimensional reaction diffusion problem, Applied Mathematics and Computation pp. 417-447 142, 2003, **Elsevier, ISSN 0096-3003, SCI indexed.**

[5] S. Natesan, **J. Jayakumar**, J. Vigo-Aguiar, Parameter uniform numerical method for singularly perturbed turning point problems exhibiting boundary layers, Journal of Computational and Applied Mathematics, pp. 121-134, 158(1), 2003, **Elsevier, ISSN 0377-0427, SCI indexed.**

[6] **J. Jayakumar**, Kalyanasundaram M., Modified Newton's method using harmonic mean for solving nonlinear equations, IOSR Journal of Mathematics, 7(4) 93-97, 2013. **ISSN 2319-765X**

[7] **J. Jayakumar** Generalized Simpson-Newton's Method for Solving Nonlinear Equations with Cubic Convergence, IOSR Journal of Mathematics pp. 58-61, 7(5), 2013. **ISSN 2319-765X**

[8] **J. Jayakumar**, P. Jayasilan, Second derivative free modification with a parameter for Chebyshev's method, International Journal of Computational Engineering Research pp. 38-42, 3(8), August 2013. **ISSN 2250-3005.**

[9] **J. Jayakumar**, Kalyanasundaram M., Generalized Power means modification of Newton's method for simple roots of nonlinear equation, International Journal of Pure and Applied Sciences and Technology pp. 45-51, 18(2), Sep 2013, **ISSN 2229 – 6107.**

[10] **J. Jayakumar**, The defect correction method applied to singularly perturbed elliptic problems, *International Journal of Scientific & Engineering Research* pp. 50-54, 5(9), Sep 2014, **ISSN 2229-5518, SCOPUS indexed.**

[11] Kalyanasundaram M., **J. Jayakumar**, Class of modified Newton's method for solving nonlinear equations, *Tamsui Oxford Journal of Information and Mathematical Sciences*, pp. 91-100, 30, Jan 2015, **ISSN 2222-4424, SCOPUS indexed.**

[12] **J. Jayakumar**, P. Jayasilan, A parametric spline method for second-order singularly perturbed boundary-value robin problems, *International Journal of Applied Engineering Research* 10(9), pp. 23747-23754, Jan 2015, **ISSN 0973-4562, SCOPUS indexed.**

[13] **J. Jayakumar**, Kalyanasundaram M., Power means based modification of Newton's method for solving nonlinear equations with cubic convergence, *International Journal of Applied Mathematics and Computation* 6(2), pp. 1-6, Jan 2015. **ISSN 0974-4665.**

[14] Kalyanasundaram M., **J. Jayakumar**, A fifth-order modified Newton-type method for solving nonlinear equations, *International Journal of Applied Engineering Research* 10(72), pp. 83-86, June 2015 **ISSN 0973-4562, SCOPUS indexed.**

[15] Babajee D.K.R., Kalyanasundaram M., **J. Jayakumar**, A family of higher order multi-point iterative methods based on power mean for solving nonlinear equations, *Afrika Matematika* 27(5), 865–876, Sep 2015, **ISSN 1012-9405, Springer, SCOPUS indexed.**

[16] Babajee D.K.R., Kalyanasundaram M., **J. Jayakumar**, On some improved harmonic Mean Newton-like methods for solving system of nonlinear equations, *Algorithms* 8, pp 895-909, 2015 DOI: 10.3390/a8040895. **ISSN 1999-4893, Indexed in ESCI, SCOPUS.**

[17] Kalyanasundaram M., **J. Jayakumar**, Higher Order Methods for Nonlinear Equations and Their Basins of Attraction, *Mathematics*, 4(2), 22; April 2016, DOI:[10.3390/math4020022](https://doi.org/10.3390/math4020022), **ISSN 2227-7390, Indexed in SCIE, SCOPUS.**

[18] ] Kalyanasundaram M., Babajee D.K.R., **J. Jayakumar**, An improvement to double-step Newton method and its multi-step version for solving system of nonlinear equations and its applications, *Numerical Algorithms*, 74 (2), 593–607 (2017), **ISSN 1017-1398, SCI indexed.**

[19] Kalyanasundaram M., **J. Jayakumar**, Some Higher Order Newton-Like Methods for Solving System of Nonlinear Equations and Its Applications, *International Journal of Applied and Computational Mathematics*, 3 (3), 2213–2230 (2017), DOI [10.1007/s40819-016-0234-z](https://doi.org/10.1007/s40819-016-0234-z). **ISSN: 2349-5103, Springer.**

[19a] Kalyanasundaram M., **J. Jayakumar**, Erratum to Some Higher Order Newton-Like Methods for Solving System of Nonlinear Equations and Its Applications, *International Journal of Applied and Computational Mathematics* (2017) 3: S1541–S1543, August 2017 **ISSN: 2349-5103, Springer.**

[20] Kalyanasundaram M., **J. Jayakumar**, Two new families of iterative methods for solving nonlinear equations, *Tamsui Oxford Journal of Information and Mathematical Sciences*, 31(1), 25-38 (2017), **ISSN 2222-4424, SCOPUS indexed.**

[21] Parimala S, Kalyanasundaram M. and **J. Jayakumar**, Revisit of Ostrowski's Method and Two New Higher Order Methods for Solving Nonlinear Equation, International Journal of Mathematics and Appl., 6(2-A),(2018), 263-270 **ISSN: 2347-1557, UGC approved Journal.**

[22] Parimala S, Kalyanasundaram M. and **J. Jayakumar**, A New Class of Optimal Eighth Order Method with Two Weight Functions for Solving Nonlinear Equation, Journal Nonlinear Analysis and Application (2018) 83-94, doi:10.5899/2018/jnaa-00430. **ISSN 2193-3472.**

[23] Parimala S, Kalyanasundaram M and **J. Jayakumar**, Modified Ostrowski methods for solving nonlinear equation, International Journal of Pure and Applied Mathematics 120(8) 59-67 (2018) **ISSN 1311-8080, SCOPUS indexed.**

[24] Parimala S and **J Jayakumar**, Some New Higher Order Weighted Newton Methods for Solving Nonlinear Equation with Applications, Mathematical and Computational Applications 24 (00059), (2019), doi:10.3390/mca24020059. **ISSN: 2297-8747, Indexed in ESCI.**

[25] Parimala S and **J Jayakumar**, Efficient two-step fifth-order and its higher-order algorithms for solving nonlinear systems with Applications, Axioms 2019, 8 (2) 37, (2019), doi:10.3390/axioms8020037. **ISSN: 2075-1680, Indexed in SCIE, SCOPUS.**

[26] Parimala S, Kalyanasundaram M and **J Jayakumar**, Optimal fourth order methods with its multi-step version for nonlinear equation and their Basins of attraction, SeMA Journal 76 559-579 (2019), doi:10.1007/s40324-019-00191-0. **ISSN: 2254-3902, SCOPUS indexed.**

[27] Parimala S, Kalyanasundaram M and **J Jayakumar**, Optimal Eighth and Sixteenth Order Methods for Solving Nonlinear Equation and their Basins of Attraction, Applied Mathematics E-Notes 21(2021) 320-343. **ISSN 1607-2510, Indexed in ESCI.**

#### **Invited Technical Lectures presented:**

[1] Finite difference methods for boundary value problems, National level seminar on Recent Trends in Mathematics, Department of Mathematics, ArulmiguPalaniandavar Arts College for Women, Palani on 6<sup>th</sup> March 2008.

[2] Introduction to Finite Difference Methods, AICTE-FDP on Computational Techniques and its Applications in Engineering Research, Department of Mechanical Engineering, Pondicherry Engineering College, Pondicherry on 30<sup>th</sup> May 2013.

[3] Finite Difference methods for solving Differential Equations, Refresher Course in Mathematics on 21.9.2016, held at UGC-HRDC, Pondicherry University, Pondicherry.

[4] Application of FDM for solving Differential Equations, Refresher Course in Mathematics on 21.7.2017, held at UGC-HRDC, Pondicherry University, Pondicherry.

[5] AICTE Model Curriculum for Engineering & Technology Institutions within India – An overview. Presented two lectures in the Online Faculty Development Programme conducted by NIT, Agartala during 18.1.21 & 22.1.21

## Details of Administrative Committees and Other Responsibilities

- **HOD, Department of Mathematics, during 24.9.2012 28.2.2014 & 8.10.2019 to till date**
- **First year Coordinator** for B.Tech Degree programme during **July 2018 to Jan 2020**
- Worked as **Member** in the following committees for admission into professional degree courses in Pondicherry Union Territory under government quota:

Committee	Number of Times	Year
➤ <b>CENTAC</b>	05	1997, 1998, 1999, 2007 and 2008
➤ <b>JET</b>	02	2007 and 2008

- Member, Time-table committee in PEC for 8 years.
  - Member of Counseling and Guidance Committee for B.Tech. Students in PEC for 3 years.
  - Member in the Library committee, PEC for 3 years.
  - Member in the Students council, PEC for 3 years.
  - Class advisor for I year B.Tech. degree during three years (2014-15, 2015-16, 2016-17)
  - Member in Ragging Prevention Committee during two years (2014-15, 2015-16)
  - Member, Board of Exams for B.Tech. in Pondicherry University, Pondicherry for 20 years
  - Member, Board for Question Paper setting and Valuation for Anna University, Chennai, Vinayaka Mission University, Salem and Sathyabama University, Chennai.
  - Member in Mathematics Board for Revision of Syllabus for Engineering Degree Programme, (for all India) constituted by AICTE in the year 2017-18.
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