
Dr. Rachana Desai

Associate Professor-Mathematics

Curriculum Vitae

Department of Science and Humanities,
K J Somaiya College of Engineering (KJSCE),
Somaiya Vidyavihar University (SVU), Mumbai, India-400077.
DOB:13/02/1982, rachanadesai@somaiya.edu

Education

2013 – 2018	Ph.D.-Mathematics , Sardar Vallabhbhai Institute of Technology, Gujarat, India <u>Title of Ph.D. Thesis:</u> Extension of Mittag-Leffler Functions and Their Properties
2002 – 2004	M.Sc.-Mathematics , South Gujarat University, Gujarat, India
1999 – 2002	B.Sc.-Mathematics , South Gujarat University, Gujarat, India

Additional Qualifications

2023	Ing.Paed.IGIP, Austria (IGIP International Engineering Educator)
2018 – 2019	IIEECP , IUCEE International Engineering Educator Certification Program, IUCEE & IGIP, Austria
2004 – 2005	B.Ed. (Bachelor of Education), Veer Narmad South Gujarat University, Gujarat, India

Awards and Achievements

2024	Award: the IUCEE Showcase Awards “ Leadership of Teaching and Learning Center Award ” by Indo Universal Collaboration for Engineering Education.
2024	Award: “ Best Paper Award ” in Eleventh International Conference on Transformation in Engineering Education
2023	Award: the IGIP Certificate and Title “ IGIP International Engineering Educator-Ing.Paed.IGIP ” by IGIP (International Society for Engineering Pedagogy), Austria .
2021	Award: Excellence in Performance: Teaching Learning Center , the Eighth International Conference on Transformations in Engineering Education (ICTIEE 2021), Indo Universal Collaboration for Engineering Education (IUCEE).
2021	Project guide for first prize winning national project , Engineering Mathematics Teacher’s Society, India.
2019	Appreciation for contributions in teaching for PWD (Person with Deficiency) students
2018	Appreciation: Excellent Student’s Feedback , KJSCE (Also received appreciation for 2015-16, 2016-17 & 2017-18)
2018	Award: Excellence in Research , Research and Development cell, KJSCE.
2017	Award: IMS Prize for the Best Paper Presentation , Indian Mathematical Society.
2016	Award: Aruna Gupta Prize for Best Paper Presentation , International Conference of Special Function and Applications (ICSFA-2016), Society of Special Functions (SSFA).
2016	Award: Excellence in Research , Research and Development cell, KJSCE.
2002	Bronze Medal , B.Sc. Mathematics, P. T. Science Sarvajanic College, India.
2002	Award: Best Cadet , National Service Scheme, Ministry of Youth Affairs & Sports, Government of India.
2001	Gold Medal , S.Y.B.Sc. Mathematics, P. T. Science Sarvajanic College, India.
2000	First Prize , F.Y.B.Sc. Mathematics, P. T. Science Sarvajanic College, India.
1995	Limca Book of World Record for mass aerobics

Experiences

11/01/2007 – Present	Assistant Professor , Department of Science And Humanities, K J Somaiya College of Engineering, Somaiya Vidyavihar University, Vidyavihar, Mumbai-400077, India. Courses Taught (Under Graduate level): Engineering Mathematics, Applied Mathematics, Computational Techniques etc.
04/01/2019 – Present	Chairman, Board of Studies-Mathematics , Somaiya Vidyavihar University, Vidyavihar, Mumbai-400077, India

- Key responsibility:** Programme Development, Curriculum Designing & approvals
- 13/01/2022 – 24/10/2023 **Visiting Faculty**, Department of Mathematics, S K Somaiya College, Somaiya Vidyavihar University, Mumbai, India.
- Courses Taught (Post Graduate Level):** Integral Transforms, Numerical Methods, Complex Analysis
- 21/08/2006 - 08/01/2007 **Lecturer**, General Engineering Department, Terna College of Engineering, Mumbai, India. **Courses Taught (Under Graduate level):** Engineering Mathematics
- 18/11/2005 - 06/05/2006 **Teacher**, Lancer's Army School, Surat, Gujarat, India.
- Courses Taught:** High school mathematics
- 04/07/2005 - 14/11/2005 **Lecturer**, General Engineering Department, Terna College of Engineering, Mumbai, India. **Courses Taught (Under Graduate level):** Engineering Mathematics, Discrete Mathematics

Research and Publications

Research Interests

Special Functions, Mathematics Education, Engineering education, Integral Transform

Research Projects

- 2018 – 2019 **Principal Investigator (PI)**, "Extended Generalized Wright Type Hypergeometric Functions", Mumbai University Minor Research Project

Peer Reviewed Journal Articles

- 2024** Rachana Desai, "Using STAD as Assessment for Learning (AfL) in Mathematics", Journal of Engineering Education Transformations.
- 2023** Rachana Desai, Nandini Rai and Jitendra Karekar "Optimum use of LMS for Dynamic Mathematics Classrooms in Blended Mode", Journal of Engineering Education Transformations, 36 (special issue 2), 492-499.
- 2022** Rachana Desai, Nandini Rai, Jitendra Karekar, A.S. Desai, "Poster Presentation: A novel online assessment tool for motivation, relevance and foundation for research in Mathematics", Journal of Engineering Education Transformations, 35 (special issue 1), 168-174.
- 2021** Rachana Desai and A. K. Shukla, "Note on the $pRq(\alpha, \beta; z)$ Function", The Journal of the Indian Mathematical Society, 88 (3-4), 288–297.
- 2020** Rachana Desai, I A Salehbhai and A K Shukla, "Integral equations involving generalized Mittag-Leffler function", Ukrainian Mathematical Journal, 72 (5).
- 2019** Deepti Saxena & Rachana Desai, "Active Learning in Mathematics through Think-Pair-Share", IETE journal of Innovation and Research, 6 (1), 1-8. ISSN 2320-8961
- 2019** P. K. Banerji, Rachana Desai, Deepali Saxena & A. K. Shukla, "Some properties of singular integral operator contains extended Mittag-Leffler Function", Palestine Journal of Mathematics, 8 (2), 137-145.
- 2017** Rachana Desai, P. K. Banerji & A. K. Shukla, "Singular Integral Equations Containing Extended Mittag-Leffler Function", Proceedings of the 16th Annual Conf. SSFA, 16 (1), 72-79.
- 2017** Rachana Desai and A. K. Shukla, Some results on the $pRq(a, b, z)$ function, Journal of Mathematical Analysis and Applications, 448 (1), 187-197.
- 2016** Rachana Desai, I. A. Salehbhai and A. K. Shukla, "Note on Generalized Mittag-Leffler function", SpringerPlus, 5 (1), 1-8.

National and International Conference Papers

- 2020** "WEM: An AV tool for motivation in engineering mathematics", epiETEME-8, TIFR, HBCSE, Mumbai, India.
- 2018** "Mellin- Barnes Integral representation of the $pRq(\alpha, \beta; z)$ function", International conference on Mathematical modeling, Applied analysis and computation-2018" at JECRC university, Jaipur, India.

- 2018** "Some Transforms of pRq Function", International Meet of Indian Mathematical Society 2018, MATA Vaishno Devi University, Katra, India.
- 2017** "Singular Integral Equations Containing Extended Mittag-Leffler Function", International Conference of Special Function and Application (ICSFA 2017), College of Engineering & technology, Bikaner, India.
- 2017** " $pRq(a,b;z)$ Function and Its Properties", Indian Mathematical Society-An International Meet at , Sri Venkateswara University, Tirupati, India.
- 2016** "Integral Equation and Generalized Mittag-Leffler Function", International Conference of Special Functions and Applications (ICSFA 2016), Jamia Millia Islamia University, Delhi, India
- 2016** "The Function $pRq(a,b;z)$ ", national Conference on Confluence of emerging Trends in multidisciplinary research areas to mathematics, Kirti college, Mumbai, India.
- 2015** "Mittag-Leffler operator and Fractional calculus", National Short Term Training Program on Fraction calculus, Integral Transforms, Special Functions and their Computations in Engineering and Sciences, SVNIT, Surat, India

Book Chapters

- 2022** 'A Survey on $pRq(\alpha, \beta; z)$ Function and its applications' in the book titled Recent Advances in Mathematical Analysis and their Applications, Department of mathematics, Kerala University, India
- 2012 & all editions after 2012 till 2019** 'SCILAB', Applied Mathematics-I for FE Semester I by G. V. Kumbhojkar, P. Jamnadas LLP publication
- 2012 & all editions after 2012 till 2023** 'SCILAB', Applied Mathematics-II for FE Semester II by G. V. Kumbhojkar, P. Jamnadas LLP publication

Academic Services

National & International Services

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|---------------------------------------|--|
| Reviewer | <ul style="list-style-type: none"> 9) The Eleventh International Conference on Transformations in Engineering Education, 2024 8) The International Symposium on Green Technologies and Applications (ISGTA 2023) Morocco, 2023 7) AICTE Sponsored IEEE International Conference on Networks, Multimedia and Information Technology (NMITCON), 2023 6) IEEE International Conference on Data Science and network security, 2023 5) The Tenth International Conference on Transformations in Engineering Education, 2023 4) The Ninth International Conference on Transformations in Engineering Education, 2022 3) Journal of Engineering Education Transformation since 2019 2) IEEE International Conference on Convergence to Digital World –Quo Vadis, 2019 1) The Eighth International Conference on Transformations in Engineering Education, 2021 |
| Session Chair | <ul style="list-style-type: none"> 3) The Eleventh International Conference on Transformations in Engineering Education, 2024 2) 4th National Conference in Applied Sciences and Humanities, Thakur college, February 2019 1) 3rd National Conference in Applied Sciences and Humanities, Thakur college of Engineering and Technology, February 2018 |
| Expert, Subject Advisory Board | Vivekanand Education Society's Institute of Technology, Mumbai, April |

	2022
Advisory and Planning Committee	2) International Conference on Transformations in Engineering Education 2023 January 2023 1) e-MAPCO 2020 (National Mathematics Project Competition), in association with Engineering mathematics teacher's society, India & SEAM, October 2020.
Workshop facilitator	3) 'Evaluation of Curriculum Revision-Model KJSCE' Eleventh International Conference on Transformations in Engineering Education, January 2024 2) 'Implementation of aspects of NEP-2020 through Closed-Loop Education System: Model KJSCE', International Conference on Transformations in Engineering Education, January 2023 1) 'Transforming Mathematics education in engineering: Model KJSCE', International Conference on Transformations in Engineering Education, January 2022
Invited Talks	8) 'Applications of Statistics', Vidyalankar School of Information Technology, Mumbai, January 2022. 7) 'Linear Algebra: Eigen values and Eigen vectors', Pillai College of engineering, Mumbai, March 2021. 6) 'Case study on KJSCE LMS', IUCEE TLC cluster meeting, November 2020 5) 'Quality Initiatives at KJSCE', IUCEE-KJSCE international webinar Series, December 2019. 4) 'LaTeX ', Short Term Training Program on Linear Algebra, Statistics and Mathematical Modeling : Hands On, KJSCE, January 2019. 3) 'Laplace Transform', Short Term Training Program on Research in Engineering, Sinhgad College of Engineering, October 2011. 2) 'Advanced Graphics', Workshop on Scilab-An Open Source platform for numerical computation by IITB under FOSSEE project at KJSCE, June 2011. 1) 'Mathematics using Scilab', FDP on Scilab, Sinhgad College of Engineering, Pune, India, January 2011.
Organizing committee member	3) Technical committee, Eleventh International Conference on Transformations in Engineering Education 2024, January 2024. 2) IUCEE National Mini-Symposium on Effective Practices in Teaching-Learning, April 2022. 1) e-MAPCO 2021 (National Mathematics Project Competition), in association with Engineering Mathematics Teacher's Society, India & SEAM, June 2021.
Guest lecturer	Course on Scilab, M.P.S.P.S.C. College of arts, commerce & science, Mumbai December 2011 to February 2012 & February 2013.
External Examiner	PhD, Department of Mathematics, Veer Narmad South Gujarat University, Surat 2023 M.P.S.P.S.C. College of arts, commerce & science, Mumbai February 2013
KJSCE Representative	IUCEE TLC monthly cluster meetings, every month since March 2019
Judge	National Mathematics project Competition, Engineering Mathematics Teachers' Society, India, December 2020 & June 2021

University and Institute Level Services

Chairman	Board of Studies-Mathematics, Somaiya Vidyavihar University (2019 – Present)
Programme Coordinator	Integrated BS-MS programme, SVU (2022 – Present)
Coordinator	The Teaching Learning Centre, KJSCE (2018 – Present) Department Event Organizing Committee, KJSCE (2021 – 2022)

Co-coordinator	Department Planning Committee, KJSCE (2022 – Present)
Point of Contact	Indo Universal Collaboration for Engineering Education (2019 – Present)
Curriculum designing	M.Sc. Mathematics, iBS-MS (integrated Bachelor of Science -Master of Science), PhD Coursework, Designed the framework, credit & examination scheme & outcome based courses to be offered in the above programmes
Course designing	Integral transforms, Special functions, Engineering Mathematics, Complex Analysis
Approved PhD Guide	Mathematics, Somaiya Vidyavihar University (2023 – Present)
Co-Guide	Final year B.Tech. students' project co-guide, Department of Electronics engineering, KJSCE
KJSCE representative	IUCEE-TLC cluster meetings (2019 – Present)
Faculty advisor	Student Association of Humanities and Sciences (2019 – 2021)
Faculty in-charge	Student Association of Humanities and Sciences (2010 – 2019)
Faculty coordinator	Emfinity – The Math Club of KJSCE (2019 – 2022)
Member	Academic Council, Somaiya Vidyavihar University (2019 – Present) Board of Examination, Somaiya Vidyavihar University (2019 – Present) Student Grievance Redressal cell, KJSCE (2014 – Present), Research Committee (2014 – 2022), Institute level Accreditation committees (NAAC & NBA), Admissions committee (2007 – 2019), Online Course committee (2010-2021), timetable committee (2007 – 2012), Student's cultural, sports and technical event committees etc.(2007 – Present), Emfinity (2022- till date)

Event Administration and Organization

Coordinator	International Event
	International expert talk on “A Lucid Introduction of Error Correcting Code” by Prof. Michel Waldschmidt, Paris, December 2018
	National Events
	National webinar on “Challenges, Innovations and Adaptations of COVID-19: Science & Society Perspectives”, October 2021
	University level Events
	6) Guest lecture on “Quantum Computing”, April 2022
	5) Workshop on “Lecture capturing solution”, April 2022
	4) Workshop on “Hands-On session on Tools for Interactive Online Teaching: Mentimeter and Quizizz”, April 2021
	3) Workshop on “MS Teams customized training sessions” February-March 2021
	2) Two Phase training program on “Create your own MOOCs with handholding support”, January 2021
	1) Arranged three visits of “Museum On Wheels” in Somaiya Campus & kept it open for residents of local vicinity & local schools, Ghatkopar (E), 2018-2019
	College level Events
	6) Workshop on “Dos and Don't for Online Teaching”, August 2020.
	5) Four days training through email for “online education”, July 2020.
	4) Workshops on “Project Based Learning” and “engineering Ethics” by Dr. Claire, USA in December 2019
	3) IUCEE International Engineering Educator Certification Program, December 2018 to November 2019
	2) Faculty Conclave, KJSCE, July 2019
	1) Workshop on "Are teachers redundant? A teacher's view" & "How to write effective research paper on engineering education" by Dr. Sridhar Iyer, April 2019
	Department level events

- 3) Workshop on “Self-healing for stress relief using chakra system”, March 2022
- 2) Guest lecture on “Fibre Optic Sensors and Applications”, February 2022
- 1) Guest lecture on “Nondestructive Testing Methods and Sensors”, February 2022

Faculty Mentor

Workshop on “How to write research paper on Engineering Education Research (EER), August 2019

Coordinator Student Association of Humanities and Sciences

- 4) Arranged and accompanied students for field trips like Echo Ethno Trek, beach cleanup drives etc. (2014-2019)
- 3) Organized several Industrial visits in industries like Parle, Nilkamal, Tarapur Atomic Research Centre, JSW etc. & accompanied students (2010-2019)
- 2) Offered workshops on ‘Vedic Mathematics’ & Organized several other workshops and trainings like ‘Mathematical modeling and simulation’, ‘FE credit and grading system’, ‘Microsoft windows 8’, ‘Evaluation system’, ‘Vipasyana Meditation’ etc. (2010-2019)
- 1) Social initiatives for students: An awareness programme on “Echo-Friendly Ganesha”, Varsova beach cleanup drive, NGO visits (HIV kids) etc. (2010-2019)

Workshops/ Trainings Attended

- 2023**
- 37) Academic visit to IISER, Pune to get inputs for better planning & implementation of integrated BS-MS programme, February 2023
 - 36) ‘Tenth International Conference on Transformations in Engineering Education’, IUCEE, January 2023
- 2022**
- 35) Conference on ‘Implementation of NEP-2020 in the State of Maharashtra’, jointly organized by Somaiya Vidyavihar University & PERA, on 30 March 2022
 - 34) Academic visit to IISER, Pune to get inputs for curriculum designing for proposed BS MS programme, March 2022
 - 33) ‘Ninth International Conference on Transformations in Engineering Education’, IUCEE, January 2022
- 2021**
- 32) One week online short term training programme on ‘Mathematical Tools and Techniques for students and engineers (MTTSE 2021)’, SVNIT, Surat, December 2021
 - 31) MATLAB Onramp course organized by MathWorks Training Services on 1 September 2021
 - 30) MATLAB IUCEE RVCE MathWorks Symposium on ‘Engineering Mathematics with MATLAB’, jointly organized by IUCEE and RVCE college in collaboration with Mathworks, September 2021
 - 29) ‘36th Annual Conference of Ramanujan Mathematical Society’, Amrita Vishwa Vidyapeetham, Coimbatore, August 2021
 - 28) ‘Eighth International Conference on Transformations in Engineering Education (ICTIEE-2021)’, IUCEE, January 2021
- 2020**
- 27) One Week Online Short Term Training Programme on ‘Fractional Calculus: Foundations to Frontiers’ (FCFF 2020), SVNIT, Surat, December 2020-January 2021
 - 26) ‘MTA Second (Online) Annual Conference – 2020’, September 2020
 - 25) Online course on ‘Online Teaching’, IUCEE, July-September 2020
 - 24) ‘Eighth International Conference to Review Research in Science, Technology and Mathematics Education (epiSTEME 8)’, HCSE, TIFR, Mumbai, January 2020
- 2019**
- 23) Workshop on ‘Train The Trainer Workshop-Developing Co-creative mindset applying Design and Systemic Approaches for Innovation in Educational Institutions’, jointly organized by DBIT, PILLET & PARTNERS and LIIGHT, Switzerland & PrePearl, September, 2019
 - 22) ‘Regional workshop of Indian Women and mathematics on research and opportunities’, HBCSE, TIFR, February 2019
 - 21) ‘An Inaugural Conference of Mathematics Teacher’s Association’, HBCSE, TIFR, Mumbai, January

- 2019
- 2018** 20) 'IUCEE International Engineering Educator Workshop Phase I', KJSCE, IUCEE, December 2018
 19) 'Indian Mathematical Society-An International Meet', Sri Mata Vaishnodevi University, Katra, Jammu, November 2018
 18) Online course on 'University Teaching', Hong-Kong University, July-October 2018
 17) 'International Conference on Mathematical modeling, Applied analysis and computation-2018', JECRC University, Jaipur, July 2018
- 2017** 16) 'International conference of Indian Mathematical Society-An International Meet', Sri Venkateswara University, Tirupati in December 2017
 15) 'International Conference of Special Function and Application-2017', College of Engineering & technology, Bikaner, November 2017
 14) 'Introduction to Complex Analysis', Wesleyan University, Coursera, September 2017
- 2016** 13) National Conference on 'Confluence of emerging Trends in multidisciplinary research areas to mathematics', Kirti college, Dadar, Mumbai, December 2016.
 12) 'International conference on Special Functions and Applications', Delhi, September 2016.
 11) 'Hands-on training on LaTeX', Loakmanya Tilak College of Engineering, Navi Mumbai, February 2016.
- 2015** 10) One Day workshop on 'How to publish a Technical paper with IEEE', August 2015, Don Bosco Institute of Technology, Mumbai.
 9) One week STTP on 'Fractional Calculus, Integral Transforms, Special functions and their computations in engineering and sciences', SVNIT, Surat, September-October 2015.
- 2013** 8) One week STTP on 'significant role of mathematical analysis in applied sciences and engineering' SVNIT, Surat in September-October 2013
 7) One week STTP on 'Current trends in computational methods for PDEs and fluid mechanics', SVNIT, Surat, August 2013
 6) One week STTP on 'Tools and Techniques for Effective Technical Writing', KJSCE, May 2013
- 2012** 5) Two weeks mega workshop at KJSCE on 'Introduction to Research Methodology', IITB, June-July 2012
 4) One week Short Term Training Program on 'Advanced Engineering Optimization Through Intelligent Technique', SVNIT, Surat, January 2012.
- 2011** 3) One week Faculty Development Program on 'Scilab', Sinhgad College of Engineering, Pune, January 2011
 2) One week workshop on 'Scilab-An Open Source Platform for Numerical Computation', KJSCE, Vidyavihar, June 2011
- 2009** 1) One week Short Term Training Program on 'Mathematical Modeling and Simulation', SVNIT, Surat, December 2009

Creating Dynamic Mathematics Classrooms

Innovation in Teaching-Learning

- Use of Active learning strategies for large and small classrooms: Think-Pair-Share, Four Corners, Stump your partner, TAPPS (Think aloud pair problem share), Round Robin, minute paper, flipped classrooms, jigsaw etc.
- Course Information Sheet (CIS)
- Motivational techniques & application oriented approach for real world connections
- Beyond syllabus activities, self-learning & peer learning
- Developed "WEM" : An innovative Audio Visual Tool For Motivation In Engineering Mathematics

Harnessing technology & Online education

- Use of LMS (moodle, coursera, Teams, Google classroom)

- Gamification tools (Menti, Quizzies, Moodle games, Kahoot, Plicker)
- Online platform for virtual class (zoom, MS Teams, Google Meet)
- Online pedagogy: Avocations, word cloud, polls, chats, use of social media, youtube, guest lectures, interactive classrooms, recorded lectures, breaking classrooms
- Use of Social media and mobile apps

Innovations in assessments

- Collaborative learning assessments : STAD (Student Team Achievement Division) , TGT (Team Game Tournament), Group discussions & brain storming
- Research based assessments: Poster presentation, Report writing, presentation on literature survey
- Adoption of Bloom's taxonomy & setting question papers covering all levels of Bloom's taxonomy
- Variety of quiz, MCQs with one correct option, multiple correct options, objective type questions,
- Gamification
- Application oriented assessment
- Variations in Assignments: activity based, rubrics, application oriented, open book assignments, quizzes etc.

Respect diversity & inclusion

- Special attention and different strategies for PWD (Person With Deficiency) students
- Remedial lectures for NRI students, slow learners & direct second year students
- Gender equality & need based education to cater diversity & different learning styles
- Faculty mentor for award winning projects in national competitions
- Dedicated office hours for one to one interactions

Professional Membership

- Society for Special Functions and Application (SSFA)
- Indian Mathematical Society (IMS)
- Mathematics Teacher's Association (MTA)
- Gujarat Ganit Mandal

Personal Details

Date of Birth: 13/02/1982

Gender: Female

Nationality: Indian

Contact: M) 8591900799

email: rachana.132@gmail.com

Address: B-28, Shree Satidham CHS, Garodia Nagar, Ghatkopar(E), Mumbai-400077, India.

Interests: Connecting People, learn new things, celebrating Indian culture & festivals, Do it yourself (DIY)

Google scholar: <https://scholar.google.co.in/citations?user=7qXyNjMAAAAJ&hl=en>

LinkedIn : <https://www.linkedin.com/in/dr-rachana-desai-72307746/?originalSubdomain=in>

Website: <https://www.somaiya.edu/en/view-member/160634?type=faculty>

OrchidID: <https://orcid.org/0000-0002-8206-1442>

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