

**UNIVERSITY OF CALICUT  
(IQAC)**

**INFORMATION FOR  
ACADEMIC AND ADMINISTRATIVE AUDIT OF THE DEPARTMENT**

**Year: 2020-21**

**(Provide information for last three years from 2016-17 to 2020-21)**

1. **Name of the Department:** Department of Statistics
2. **Year of establishment:** 1988
3. **Courses offered:** PG, M. Phil., Ph.D., Others

<b>Year</b>	<b>PG</b>	<b>M.Phil</b>	<b>Ph.D.</b>	<b>Others</b>
2016-17	Yes	Yes	Yes	-
2017-18	Yes	Yes	Yes	-
2018-19	Yes	Yes	Yes	-
2019-20	Yes	Yes	Yes	-
2020-21	Yes	Yes	Yes	-

4. **Courses introduced during last 4 years:** - Nil
5. **Does the department have Academic flexibility? If yes since when?** - No
6. **Interdisciplinary programs offered and departments involved:** - Nil
7. **Courses conducted in collaboration with other universities and Institutions:-** Nil
8. **Details of programmes discontinued, if any, with reasons:** - Nil
9. **Examination System: Annual/ Semester/Choice Based Credit System/ Credit and Grading system/ any other system, specify:** Choice Based Credit System
10. **Participation of the department in the curriculum development for courses offered by the Departments :** Faculty of the Department are members of BoS/AC/Faculty of Science.
11. **Does the department have different syllabus than the one used by university for PG courses?** Yes
12. **Number of teaching posts sanctioned, filled and vacant.**

**2016-17 to 2019-20**

<b>Designation</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Filled under CAS</b>
Professor	1	1	2
Associate Professor	2	Nil	Nil
Assistant Professor	4	2	-
Total	7	3	2

**2020-21**

<b>Designation</b>	<b>Sanctioned</b>	<b>Filled</b>	<b>Filled under CAS</b>
Professor	1	1	2
Associate Professor	2	Nil	Nil
Assistant Professor	4	3	-
<b>Total</b>	<b>7</b>	<b>4</b>	<b>2</b>

**13. Faculty profile with name, qualification, designation, experience, nature of appointment (confirmed/ probation/temporary):****a) Appointed on Government Sanctioned Post.****2016-17**

<b>Name</b>	<b>Designation</b>	<b>Qualifications</b>	<b>Teaching/Research Experience</b>	<b>Nature of appointment,</b>
Dr. K.Jayakumar	Professor	Ph.D.	20	Promotion (CAS)
Dr. M.Manoharan	Professor	Ph.D.	26	Promotion (CAS)
Dr. C.Chandran	Professor	Ph.D.	25	Direct
Dr. N Raju	Professor	Ph.D.	33	Promotion (CAS)

**2017-18 to 2019-20**

<b>Name</b>	<b>Designation</b>	<b>Qualifications</b>	<b>Teaching/Research Experience</b>	<b>Nature of appointment,</b>
Dr. K.Jayakumar	Professor	Ph.D.	22	Promotion (CAS)
Dr. M.Manoharan	Professor	Ph.D.	28	Promotion (CAS)
Dr. C.Chandran	Professor	Ph.D.	27	Direct

**2020-21**

<b>Name</b>	<b>Designation</b>	<b>Qualifications</b>	<b>Teaching/Research Experience</b>	<b>Nature of appointment,</b>
Dr. K.Jayakumar	Professor	Ph.D.	23	Promotion (CAS)
Dr. M.Manoharan	Professor	Ph.D.	29	Promotion (CAS)
Dr. C.Chandran	Professor	Ph.D.	28	Direct

Dr Dileepkumar M	Asst. Professor	Ph.D.	1	Direct
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**b) Appointed from University Fund (Ad-hoc/Guest/contract Faculty).**

**2020-2021**

Name	Designation	Qualifications	Teaching/Research Experience	Nature of appointment,.
Ann Sania	Assistant Professor	M.Sc.	1	Hourly Basis
Aifoona Ahammed	Assistant Professor	M.Sc	-	Hourly Basis

**2019-2020**

Name	Designation	Qualifications	Teaching/Research Experience	Nature of appointment,.
Dileep Kumar M	Assistant Professor	Ph.D.	1+5	Contract
Ann Sania	Assistant Professor	M.Sc., M.Phil.	1	Hourly Basis
Sharon Varghese	Assistant Professor	Ph.D.	1+5	Hourly Basis

**2018-2019**

Name	Designation	Qualifications	Teaching/Research Experience	Nature of appointment,.
Anand R	Assistant Professor	M.Sc.	1	Contract
Jeena M P	Assistant Professor	M.Sc., M.Phil.	1	Contract
Salima P	Assistant Professor	M.Sc.	1	Hourly Basis

**2017-2018**

Name	Designation	Qualifications	Teaching/Research Experience	Nature of appointment,.
Nidin P	Guest Lecturer	M.Sc.	1	Contract
Jumna T	Guest Lecturer	M.Sc.	1	Contract

**2016-2017**

Name	Designation	Qualifications	Teaching/Research Experience	Nature of appointment,.
Nidin P	Guest Lecturer	M.Sc.	1	Contract

**14. List of Visiting Fellows/Teachers, Adjunct and Emeritus Professors, (for last 4 years).**

Nil

**15. Percentage of classes taken by temporary/visiting faculty (programme-wise information): -**

2016-2017 : M.Sc (1<sup>st</sup> and II<sup>nd</sup> Years) 20%  
 2017-18 to 2020-2021 : M.Sc (1<sup>st</sup> and II<sup>nd</sup> Years) 40%

**16. Programme-wise Student Teacher Ratio: (Average of 4 Years)**

M.Sc - 4:1

M.Phil – 2:1

**17. Number of academic support staff (technical) and administrative staff sanctioned, filled and vacant:**

**2016-17**

Sl. No.	Posts	Sanctioned posts	Filled	Actual
1	Laboratory Assistant	0	0	0
2	Clerk (office)	1	1	1
3	Laboratory Attendant	0	0	0
4	Peon	1	1	1
5	Other	2	2	2

**2017-18 to 2020-21**

Sr. No.	Posts	Sanctioned posts	Filled	Actual
1	Laboratory Assistant	Nil	-	-
2	Clerk (office)	Nil	-	-
3	Laboratory Attendant	Nil	-	-
4	Peon	1	0	CLR Peon (1)
5	Section Officer	1	1	1
6	Computer Assistant	1	1	1
7	Professional Assistant (Library)	1	1	1

**18. Thrust areas of research as identified by the department:**

Stochastic Processes and their Applications, Reliability and Survival Analysis, Extreme Value Theory, Time Series Analysis and Forecasting, Applied Probability, Distribution Theory and Sampling Theory.

**19. Information about research grants, projects completed and ongoing during the period of last 4 years**

a) From National funding agencies (like UGC, CSIR, DST, DBT etc): - Nil

b) From International funding agencies: - Nil

**20. Funds received at Departmental level through DST-FIST; CSIR, UGC-SAP/CAS,**

DAE, DBT, BRNS, ICSSR, AICTE, etc. - Nil

**21. Research facilities available in the department and recognition received, if any?**

Computer Lab and Library with soft wares such as SPSS, SYS STAT and Mat Lab

**22. Special research laboratories sponsored by / created by industry or corporate bodies.**

Nil

**23. Publications:**

\* Number of papers published/Accepted in peer reviewed journals(National/International)-

34

\* Number of papers published in proceedings:- 6

Sr. No.	Papers published in peer reviewed journals	Monographs, Books, Chapters in books	Citations	h-index	Impact factor range/Average Impact factor
1	K.Jayakumar & K.K. Sankaran - A generalization of Inverse Marshall-Olkin family of Distributions. Journal of Data Science, Vol.18, pp 1-43 (2020)	-	-	-	-
2	K. Jayakumar, A.P. Kutykrishnan & Bindu Krishnan (2020) Heavy tailed Pareto Distribution: Properties and Application, Journal of Data Science, Vol.18, pp.825-848.	-	-	-	-
3	Muhammad Shabeer, A. & K. Jayakumar (2020) q-Gompertz Distribution and its applications. Applied Statistical Techniques and Stochastic Modelling edited by Niccy Sebastian and Sajesh T.A., pp. 35-48.	-	-	-	-
4	K Jayakumar and T Sajayan (2020) On Estimation of Geometric Stable Distributions. Journal of the Indian Society for Probability and Statistics 21,329–347	-	-	-	-
5	K Jayakumar, Bindu Krishnan and G G Hemadani (2020) On a new generalization of Pareto distribution and its applications. Communications in Statistics - Simulation and Computation, Vol.49, No.5, 1264–1284.	-	-	-	0.614
6	K. Jayakumar & K.K. Sankaran (2019) Exponential Intervened Poisson Distribution, Communications in Statistics – Theory and Methods.(Accepted). DOI: 10.1080/03610926.2019.1682161.	-	-	-	0.424

7	K Jayakumar and Girish Babu, M. (2019) On a generalized class of Weibull distributions and its applications. Journal of the Kerala Statistical Association, Vol. 30, pp 21-46	-	-	-	-
8	K Jayakumar and Girish Babu, M. (2019) Discrete Additive Weibull Geometric Distribution, Journal of Statistical Theory and Applications, Vol. 18, pp. 33-45	-	-	-	-
9	K. Jayakumar & K.K. Sankaran (2019) Discrete Linnik Weibull distribution, Communications in Statistics - Simulation and Computation, Vol. 48, pp. 3092-3117.	-	-	-	0.61 4
10	K Jayakumar and Girish Babu, M. (2019) A New Generalization of the Frechet Distribution: Properties and Application, Statistica, Vol. 79, pp. 267-289.	-	-	-	-
11	K. Jayakumar and A.P. . Kuttykrishnan (2018) A bivariate Laplace autoregressive process. Proceedings of the National Conference on Advances in Statistical Methods – NCASM, pp. 19-27 Kannur University. (Edited by Joby K Jose & Thomas Xavier)	-	-	-	-
12	Girish Babu, M. and K Jayakumar (2018) Characterizations of Weibull truncated negative binomial distribution, Proceedings of the National Conference on Advances in Statistical Methods–NCASM pp. 99-112	-	-	-	-
13	K. K. Sankaran and K. Jayakumar (2018) A new generalization of Rayleigh distribution, Proceedings of the National conference on Advances in Statistical Methods – NCASM pp. 141-155.	-	-	-	-
14	K.Jayakumar & K.K. Sankaran (2018) A Generalization of Discrete Weibull Distribution, Communications in Statistics – Theory and Methods, Vol. 47, pp.6064-6078.	-	-		0.42 4

15	K.Jayakumar & M. Girish Babu (2018) A new bivariate distribution with modified Weibull distribution as marginals, Journal of Indian Society for Probability and Statistics, Vol. No. 19, pp. 271-297.	-	-	-	-
16	K.Jayakumar & M. Girish Babu (2018) Discrete Weibull geometric distribution and its properties. Communications in Statistics- Theory and Methods 47, 1767-1783.				
17	K.Jayakumar & K.K. Sankaran (2017) A Discrete Generalization of Marshall – Olkin Scheme and its Application to Geometric Distribution, Journal of the Kerala Statistical Association 28, pp. 1-21.	-	-	-	-
18	K.Jayakumar & M. Girish Babu (2017) T-transmuted X family of distributions, STATISTICA Vol.77, pp. 251-276.	-	-	-	-
19	K.Jayakumar & K.K. Sankaran (2017) Generalized Exponential Truncated Negative Binomial Distribution, American Journal of Mathematical and Management Sciences Vol. 36, pp. 98-111.	-	-	-	0.83
20	K. Jayakumar K K Sankaran, On a Generalization of Uniform Distributors & Its Properties, Statistica, 2016, Vol. LXXVI, 83-91				
21	K.K. Sankaran, K. Jayakumar, A new Extended Uniform Distribution, 2016, International Journal of Statistical Distributions and Applications				

22	K. Jayakumar A new Generalization of Inverse Marshall Olkin family and related Inverse Exponential Model, Journal of the Kerala Statistical Association, Vol. No. 29, 42-63 (2018)	-	-	-	-
23	M Manoharan Birnubaum Joint Importance Measures for Multi-State System, Vimala International Research Journal, Vol. 3, pp. 7-10 (2018)	-	-	-	-
24	M Manoharan Dynamic Multi State System Reliability Analysis of Power Generating Systems Using Lz transform, ProbStat Forum- an e- journal in Probability, Statistics & Optimization, Vol. 11, pp. 81-89 (2018)	-	-	-	-
25	M Manoharan Reliability Analysis of a Multi State System with Common Cause Failures using Markov Regenerative Process, Reliability Theory & Applications, Vol. 13, pp. 82-88 (2018)	-	-	-	-
26	M Manoharan 'Evaluation of System Performance Measures of Multi-State Degraded System with Minimal Repair', Reliability Theory & Applications, Vol. No.12. pp. 76-83 (2017)	-	-	-	-
27	M Manoharan Infinite Divisibility of Some SteadyState Queue Characteristics, Journal of the Indian Society for Probability and Statistics, Vol. 18, pp. 215-224 (2017)	-	-	-	-
28	M Manoharan The forces of change in Higher Education University News – A weekly Journal of Higher Education. Vol. 55, pp .41-45 (2017)	-	-	-	-
29	C Chandran On the Characteristic function of Extrema with some applications, Probstat Forum	-	-	-	-



30	M Manoharan (jointly with Joby K Jose and Drisya, M), Estimation of stress-strength reliability using discrete Phase Type distribution, Communications in Statistics Theory and Methods, 2020,(IF 0.612)				
31	M Manoharan (jointly with P. Kavya) On a Generalized Lifetime Model Using DUS Transformation, Applied Probability and Stochastic Processes, 2020, p281-291				
32	M Manoharan (jointly with V.P. Praveen), Analysis of Inventory Control Model for Items having General Deterioration Rate Applied Probability and Stochastic Processes, 2020, p293-306				
32	M Manoharan (jointly with Vidhya G Nair), Reliability Analysis of Periodically Maintained Systems using Semi-Markov Processes based UGF Technique International Journal of Statistics and Reliability Engineering, December 2020, No.3. Vol.7.				
33	M Manoharan (jointly with V M Chacko) On Association in Time of Markov Processes with Application to Reliability and Survival Analysis, Statistics and Application, (Accepted for publication)				
34	M.S. Sreekala &M. Manoharan, 'Analysis of Restricted Queueing Networks – A Blocking approach', Journal of Statistical Science and Application (JSSA) October 2016, Vol. 4, No. 09-10, pp220-230				
35	M.S. Sreekala &M. Manoharan, 'A Queueing Network Model with Blocking and its Applications in Health Care' International Journal of Latest Trends in Engineering and Technology ( IJLTET), Vol.7(1), pp 103 -113				
36	M. Manoharan & T.D. Xavier, 'Stochastic Modelling of Multistate Disease Dynamics				

	under Random Environments', Proceedings of the SMRLO'16 pp. 393 -402				
37	K.V. Abdul Rasheed &M. Manoharan,'Markovian Queueing System with Discouraged Arrivals and Self Regulatory Servers' Advances in Operations Research, Volume 2016 (2016), Article ID 2456135, 11 pages				
38	M.S. Sreekala &M. Manoharan,' Analysis of Restricted Queueing Networks – A Blocking approach', Journal of Statistical Science and Application (JSSA) October 2016, Vol. 4, No. 09 - 10, pp220 -230				
39	M.S. Sreekala &M. Manoharan,' A Queueing Network Model with Blocking and its Applications in Health Care' International Journal of Latest Trends in Engineering and Technology ( IJLTET), Vol.7(1), pp 103 -113.				
40	M. Manoharan& T.D. Xavier, 'Stochastic Modelling of Multistate Disease Dynamics under Random Environments', Proceedings of the SMRLO'16 pp. 393 -402.				

24. **Details of patents filed & granted and income generated:** Nil

25. **Consultancy services provided, name of the teacher/s and income generated:**  
Nil

26. **Details of teachers invited as resource persons for Refresher courses, Orientation courses, Seminars, Workshops, Conferences at national and international levels.**

**2016-2017**

<b>Sl. No</b>	<b>Name</b>	<b>Title of the event</b>	<b>Organizer &amp; venue</b>	<b>International/ National/ local</b>	<b>Period</b>
1	Dr.K.Jayakumar	Seminar on Applied Statistical Methodology with Special Emphasis on Time Series Analysis & Annual Govt. of KSA – Attended & Delivered in Invited talk	Nirmala College, Muvattupuzha	National	12th & 13th February 2016
2	Dr.K.Jayakumar	Delivered Lectures on Time Series Data Analysis	Department of Statistics, University of Kerala		11th April 2016
3	Dr.K.Jayakumar	A New Generalization of Exponential Data and Related Time Series Models	University of Mumbai	International	27th - 29th June 2016
4	Dr.K.Jayakumar	Discovering Data Characteristics- Handled Two Sessions at the Training Programme on Time Series Analysis	CET School of Management, Govt. College of Engineering, Thiruvananthapuram	National	14th November 2016
5	Dr.M.Manoharan	Two days workshop on Random Processes and Applications.	Dept. of Mathematics, MES College of Engineering Kuttippuram	National	26 & 27 October 2016
6	Dr.M.Manoharan	Training Programme on Financial Administration.	UGC-HRDC University of Calicut	Local	24-09-2016

7	Dr.M.Manoharan	Invited lectures on Queueing Theory I and II	Dept. of Mathematics MES College of Engineering, Kuttippuram	National	26-10-16 27-10-16
8	Dr.M.Manoharan	External Examination for M. Phil. Viva Voce in Statistics	Dept. of Statistics University of Jammu	National	13-07-16
9	Dr.M.Manoharan	Chairman, Board of Ph. D. Viva Voce	Dept. of Statistics SV University, Tirupati	National	28-06-16
10	Dr.M.Manoharan	External Examination for M. Phil. Viva Voce in Statistics	Dept. of Statistics University of Jammu	National	13-07-16
11	Dr.M.Manoharan	Chairman, Board of Examiners	Ph.D . Open Defence (Viva Voce) , Dept. of Statistics Bangalore University	National	10-05-16
12	Dr.M.Manoharan	Special Lectures on Stochastic Processes and Models; PH Distribution and its Properties	Karnatak University, Dharwad, Dept. of Studies in	National	03-03-16 & 04-03-16
	Dr.M.Manoharan	Second International Symposium on Stochastic Models in Reliability Engineering, Life Science and Operations Management (SMRLO'16) (Plenary Talk : 'Stochastic Modeling of Multistate Disease Dynamics	SCE, Beer Sheva, Israel,	International	February 15-18, 2016.

		<b>under Random Environments')</b>			
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**2017-18 to 2019-20**

Sl.No	Name	Title of the event	Organizer & venue	International/ National	Period
		International Conference – ICSTC 2019  Delivered an invited talk and chaired a session.	Department of Statistics, University of Kerala	International (Invited Talk)	18-20, December 2019
1	Dr. K. Jayakumar	National Seminar on Recent Trends in Statistical Theory and Applications- 2019 (NSSTA-2019)  Delivered an invited talk and chaired a session.	Department of Statistics, University of Kerala	National(Invited Talk)	27-29 June 2019.
		National Seminar on Recent Trends in Statistical Sciences (RTSS-2019) in conjunction with Annual Conference of KSA  Delivered an invited talk and chaired a session.	Department of Statistics, University of Kerala and Kerala Statistical Association	National(Invited Talk)	7-9 March 2019
		Delivered a talk at the National Science Day Celebrations	Dept. of Statistics, University of Kerala	National(Invited Talk)	18 Feb. 2019
		Invited Talk Entitled "On Some Recent Generalization of Exponential Distribution"	Dept Statistics St. Thomas College(Autonomous, Thrissur.	National(Invited Talk)	15-17 Feb.2018

		Invited Talk on :Application of Skew Laplace Distribution in Biological Data Modelling	Dept of Statistics St. Thomas College , Pala in Collaboration with Christian Medical College, Vellore and University of Maryland, USA	International (Invited Talk)	03-05 January 2018
		Invited talk on “Kumaraswamy Distribution: Some Recent Developments and New Results”	Dept of Statistics, University of Kerala	International (Invited Talk)	14-16.Dec.2017
		National Seminar on Recent Trends in Statistical Theory and Applications- 2017	Department of Statistics, University of Kerala.	National (Invited Talk)	28-30 June, 2017.
		National Conference on Advances in Statistical Sciences	Department of Statistical Sciences, Kannur University.	National (Invited Talk)	17-18, Feb. 2017.
2	Dr. M. Manoharan	Resource person for the Induction Programme at and handled a couple of sessions on the topic- “Some Future Paradigms for Higher Education”	MHRD, TLC, Department of Education, University of Calicut	National(Invited Talk)	14/02/2019.
		Seminar Talk on SWAYAM and MOOCs for the Teaching Staffs. on.	Thunchath Ezhuthachan Malayalam University, Tirur	National(Invited Talk)	23.01. 2019
		The International Conference on Advances in Applied Probability and Stochastic Processes.	Centre for Research in Mathematics, CMS College Kottayam	International(Invited Talk)	January 7 to 10, 2019.
		Participated and presented a paper entitled – “An Approximate Method for Open Restricted Queuing Networks”			

	Delivered the “Prof. S.P. Rajagopalan Endowment Lecture on the topic- ‘On optimal warranty policy with preventive maintenance for product /system under phase-type life distribution’.	Department of Statistics, University of Madras, Chennai	National(Invited Talk)	19-20 March, 2018
	Invited Talk entitled – “A complex survival model under random environment”	Department of Statistics, Farook College (Autonomous), Kozhikode	National(Invited Talk)	7-8 March 2018.
	Invited Talk entitled- “Operational and Economic Analysis of Queuing Systems”	Dept. of Statistics, St. Thomas College (Autonomous), Thrissur	National(Invited Talk)	15-17 February 2018.
	Invited Lecture entitled “On Restricted Queuing Networks”	Bharathiyar University, Coimbatore	International(Invited Talk)	January 5-7, 2018
	Invited Talk on “Advances in Queuing Networks: Applications in Health Care System”	Christian Medical College, Vellore and University of Maryland, USA	International(Invited Talk)	03-05 January 2018.
	Organized a session titled “4343: Advances in Queuing Theory and Applications” ; and also delivered an invited talk on “Identifiability of Queuing Systems - Some Recent Developments	The 2017 IISA International Conference on Statistics held at HICC, Hyderabad, India	International(Invited Talk)	28-30 December 2017
	Statistical Techniques in Applied Areas	Research and PG, Department of Statistics, St. Thomas College(Autonomus)	National(Invited Talk)	27-18 February 2017

		National Conference on Advances in Statistical Sciences in conjunction with the Annual Conference of KSA	Department of Statistical Sciences, Kannur University, Kerala.	National(Invited Talk)	17-28 February 2017
3	Dr. Chandran C.	National Seminars on recent trends in Statistics (NSRTS)  Copula of Bivariate Distributions closed under Extrema	Dept of Statistics, University of Calicut	National	13-15, March 2018
		International Conference theory and applications of Statistics and Information Sciences (TASIS-2018)  On the Characteristic function of rth Order Statistic	Organized by Dept of Statistic Bharathiyar University	International	07 January 2018
		International Conference on Statistics for Twenty-First Century(ICSTC-2017) On the Characteristic function of Extrema:Independent Non-Identical case	Dept of Statistics, University of Kerala	International	16.December 2017

**2020-21**

Sl. No	Name	Title of the event	Organizer & venue	International/ National	Date
1	K. Jayakumar	Webinar on Statistics For Planning & Development	Little Flower College, Guruvayoor	National	29 June 2020
2	K Jayakumar	National Seminar on Recent Trends in Statistical Theory and Applications- 2020	Webinar Organized by ISPS, KSA & Department of Statistics, University of Kerala.	National	June 29 to July 01, 2020



3	K Jayakumar	National Seminar on Advanced Developments in Statistical Theory and Applications	KSA & Department of Statistics, Christ College.	National	28-29 February 2020
4	K Jayakumar	National Seminar on Role of Statistics in Data Science	Jain Demed to be University, Kochi	National	29 June 2020.
5	M Manoharan	Three day online training programme on the topic CBCSS-UG Regulation 2019	MHRD-TLC, Department of Education, University of Calicut	National	15-07-2020
6	M Manoharan	Three day online training programme on the topic CBCSS-UG Regulation 2019	MHRD-TLC, Department of Education, University of Calicut	National	07-07-2020
7	M Manoharan	Webinar on the topic 'A blissful thought on Statistics'	PG & Research Department of Statistics, Farook College (Autonomous)	National	29-06-2020
8	M Manoharan	UGC-NAAC accreditation strategies in institutions	IQAC, MES College, Erumeli	National	16-06-2020

**27. Details of teachers participated in Refresher courses, Orientation courses, Seminars, Workshops, Conferences at national and international levels.(participant, presented paper, chaired the session)**

See item number 26

**28. Participation of teachers in various academic activities as members of committees at University level, State level, National level, International level bodies. (give details)**

**2016-2017**

**Dr. K. Jayakumar**

- Appointed as Member, Scientific Advisory Committee, Malabar Cancer Centre, Thalasserry.
- Elected as the President of the Kerala Statistical Association.
- Appointed as the member of PG Board of Studies in Statistics of University of Calicut; Christ College (Autonomous), Irinjalakkuda; Board of Studies in Bio Physics, University of Calicut; UG BoS in Statistics of Yuvaraja's College (Autonomous), Mysore.
- Appointed as Member, Board of Adjudicator's of PhD Thesis of S.V. University, Tirupati & University of Kerala
- Extrenal Examiner for MPhil & MSc (Statistics) Examinations of University of Kerala, Bangalore University.
- Nominated as the subject expert in the RAC of Farook College, Calicut.

**Dr. M. Manoharan**

- *Content Editor* of the Course : Foundations of Mathematical Statistics for the Discipline of *B.A.(Hons.) Mathematics* launched in 2016 as a part of MOOC through the SWAYAM platform that has been facilitated by the EMMRC, University of Calicut.
- Officiated as observer for the conduct of CMAT and GPAT- 2016 conducted by AICT, Govt. of India on 15 & 17 January 2016.
- Has been appointed as the Chairman, PG Board of Studies in Statistics , University of Calicut in 2016.
- Has been a member of the Board of Studies in Statistics of CUSAT, St. Thomas College(Autonomous)- Thrissur and St. Joseph's College (Autonomous)- Devagiri, Kozhikode.
- Has been appointed as External Examiner for M.Sc. Statistics Examinations, 2016 of Bangalore University, Mangalore University, CUSAT and Mysore University.

Sl.No	Name	Title of the event	Organizer & venue	International/ National	Date
1.	Dr. K Jayakumar	Scientific Advisory Committee Meeting	Malabar Cancer Centre	National	27 April, 2019
2.	Dr. K Jayakumar	Chairman to conduct Open defence/Viva-voce of Ph.D Thesis of the candidate Mrs. Sibil Jose.	M.G University, Kottayam	National	15.11.2019
3	Dr. M. Manoharan	External Expert to conduct the Open Defence and Viva-Voce of the Ph.D. thesis entitled “Bivariate and Conditional Partial Moments: Some properties and Applications” in respect the candidate Sri. Vipin, N.	Department of Statistics, CUSAT, Kochi-22	National	24.07.2019
4	Dr.M. Manoharan	Attended as an External Expert in the Assessment Committee of CSIR-JRF	Department of Statistics, Cochin University of Science &	National	21.01.2019

			Technology.		
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**29. Details of teachers appointed/nominated on Editorial Boards at university, state, national and international levels.**

Dr. K.Jayakumar, Chief Editor, Journal of the Kerala Statistical Association in 2020.

**30. Awards / Prizes and recognitions received by teachers at university, state, national and international level: - Nil**

**31. Awards and Prizes received by students at university, state, national and international level:**

\* Anusree George (MSc 2018 Admission) Won III Position in All India “ Spot Essay Writing Competition 2019 for PG Students of Statistics” conducted by the Ministry of Statistics & Programme Implementation on 24.2.2019.

\* Ms. Johnlin C Johnson, Ms. Nithuna K and Ms. Shifa K.M.(MSc 2018 Admission) won first price in the All India project competition conducted by the Indian Society for Probability & Statistics (ISPS) in 2019.

\* Dr. Dileepkumar M, Assistant Professor on contract has won the AR Kamat best thesis award at ISPS Conference in 2019.

**32. Details of Seminars/ Conferences/Workshops organized at university, state, national and international level and the source of funding with details:**

**2017-18- to 2019-20**

<b>Name of Conference/ Seminars / Workshops</b>	<b>Funding agency</b>	<b>No. of Participants</b>	<b>University/State/National/ International</b>	<b>Dates</b>
Career Opportunities in Statistics	Non-Plan Fund	50	University	19.10.2016
Statistical Computing using SAS & R	Non-Plan Fund	60	University	27.02.2016
R&Python	Non-Plan Fund	60	National	12-13 February 2020
Workshop on Linear Models	Non-Plan Fund	57	University	15-16 March 2019
Seminar Recent Trends in Statistics	Non-Plan Fund	145	National	13 to 15 March 2018
Workshop on R Programming	Non-Plan Fund	41	National	28-29 March 2017

### 33. Student profile programme-wise at PG

PG	Applications Received	No. of students Admitted	Seats Available	Male	Female	Total	Year
M.Sc	1329	26	25	3	23	26	2020-2021
M.Sc	Through CAP at DoA	20	20	9	11	20	2019-2020
M.Sc	Through CAP at DoA	20	20	2	18	20	018-2019
M.Sc	Through CAP at DoA	20	20	2	18	20	2017-2018
M.Phil	Through CAP at DoA	6	6	1	5	6	2019-2020
M.Phil	Through CAP at DoA	5	6	1	4	5	018-2019
M.Phil	Through CAP at DoA	1	6		1	1	2017-2018

Ph.D	Through CAP at DoA	3	-	1	2	3	2019-2020
Ph.D	Through CAP at DoA	-	-	-	-	-	018-019
Ph.D	Through CAP at DoA	4	-	1	3	4	2017-2018
<b>M.Sc</b>	441	21	21	2	19	21	2016-2017

**34. Year-wise results of students at PG:**

PG	Year	Appeared	Passed	Pass %	Grade %			
					O	A	B	C
M.Sc	2021	-	-	-	-	-	-	-
M.Sc	2020	-	-	-	-	-	-	-
M.Sc	2019	20	15	75	3	5	7	-
M.Sc	2018	20	16	80	2	5	9	-
M.Sc	2017							

**35. Information about M. Phil. programme:**

Year	Applications Received	No. of students admitted	Male	Female	Total
2020-2021	28	3	1	2	3
2019-2020	Through DoA	6	1	5	6
2018-2019	Through DoA	5	1	4	4
2017-2018	Through DoA	1	0	1	1
2016-2017	-	-	-	-	-

**36. Information about Ph. D. programme :**

Year	Applications Received	No. of students admitted	Male	Female	Total
2020-2021	65	2	-	2	2
2019-2020	68 (All the Research centers in Calicut University)	12	4	8	12
2018-2019	33 (All the Research centers in Calicut University)	-	-	-	-
2017-2018	(All the Research centers in Calicut University)	4	1	3	4
2016-2017	-	-	-	-	-

**37. Number of students awarded M.Phil., Ph.D ,Degree :**

Year	M.Phil	Ph.D.	Male	Female	Total
2021	Nil	Nil			
2020	Nil	1	1	-	1
2019	5	3	2	6	8
2018	-	-	-	-	-
2017	-	1	-	1	1
2016		1		1	1

**38. Diversity of Students : (Year-wise)**

**2020 Admission**

Name of the Programme	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
UG	-	-	-	-
PG	-	-	-	Nil
M.Phil.	-	-	Nil	Nil

Ph. D.	100%	-	Nil	Nil
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**2019 Admission**

Name of the Programme	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
UG	-	-	-	-
PG	100%	Nil	Nil	Nil
M.Phil.	60%	30%	10%	Nil
Ph. D.	60%	30%	10%	Nil

**2018 Admission**

Name of the Programme	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
UG	-	-	-	-
PG	100%	Nil	Nil	Nil
M.Phil.	50%	25%	25%	Nil
Ph. D.	-	-	Nil	Nil

**2016-2017**

Name of the Programme	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
UG				
PG				
M.Phil.				
Ph. D.				

**39. Number of students cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give Category wise data.**

Year	MPSC/UPSC	NET/ SET	GATE	Other Exams	Total
2020-2021			1		1
2020	-	-	1	-	1
2019	-	3	2	1	7
2018	-	2	1		3
2016-2017			1		1

**40. Student progression/ placement record: Number/ percentage of students proceeded for higher studies Number/percentage of students placed:**

Year	% proceeded for higher studies		% of students placed
	UG to PG	PG to Ph.D./ M.Phil	
2020	-	15%	10%
2019	-	30%	50%
2018	-	15%	30%

**41. Diversity of Faculty:**

**2016- 2017**

Teaching faculty	%
from the same university	25
from other universities within the State	50
from other States	-
from outside the country	25

**2017-18 to 2019-20**

Teaching faculty	%
from the same university	0
from other universities within the State	66.66
from other State	-
from outside the country	33.33



**2020-2021**

Teaching faculty	%
from the same university	—
from other universities within the State	75
from other States	-
from outside the country	25

**42. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. / D.Lit.: -**

2016-2017	: 4
2017-18 to 2019-20	: 3
2020-2021	: 4

**43. Present details of departmental infrastructural & other facilities with regard to**

- a) Central Library Books and Journals, etc, relevant to Department: - 751  
b) Departmental Library (books, journals etc.) :3050 (Books), 50 (Journals - Back volume)
- c) Computers and Internet facilities for staff 6  
d) Total number of class rooms 5  
e) Class rooms with ICT facility 2  
f) Students' laboratory : 1(Computer Lab)  
g) Research laboratories :-  
h) Seminar Hall 1  
i) Smart class room 2  
j) Any other facility :-

**44. List of post-doctoral students and Research Associates**

- a) Post-doctoral. Students -Nil  
b) Research Associates. - Nil

**45. Number of post graduate students getting financial assistance from the university/state / central government .**

2020 Admission-	90%
2019 Admission-	80%
2018 Admission –	70%
2017 Admission-	100%
2016 Admission-	80%

**46. Curricular Aspects:**

- a) Does the faculty take initiative in curriculum development process? - Yes  
b) Is curriculum suitable to make students globally competitive in the subject? If yes,

**substantiate.-**

Yes. Students get cleared national level tests.

- c) **Does the department offer program with sufficient no. of electives options.** - Yes
- d) **While framing curriculum, is feed-back taken from stakeholder's viz. Students/Alumni/Parents/Employers considered?** - Yes
- e) **What is the frequency of curriculum revision? (3/4/5 years or more)** - Four years
- f) **Does the curriculum have emerging thrust areas, including interdisciplinary areas? (If yes, elaborate).** – Yes. Papers such as Discrete- q distributions, Frailty Models & Stochastic Modeling have applications in various emerging areas of study/research, and have relevance in interdisciplinary research.

**47. Teaching-Learning, Evaluation.**

**1) Number of teachers preparing & following Academic Teaching plan –**

All teachers (3 Permanent and 3 contract)

**2) How many teachers use the following teaching methods:** - All teachers

- a) Interactive lecture method using blackboard, Group discussions, Problem solving, Seminars. : (All teachers)
- b) Use ICT methods to support lectures. : (All teachers)

**3) Does the Department have Peer review processes? If yes, are the suggestions effectively used to improve the teaching quality? -**

Student assesment of teachers through questionnaires provided by CCSS office.

**4) Does the department have any mechanism to ensure that entire syllabus is completed?** - Yes

**5) Do you offer Bridge/Remedial courses? If yes, Give details.**

Weak students are given special attention.

**6) What is the method for conducting internal evaluation?**

As per CCSS guidelines.

**48. Teacher Performance:**

**1) Whether the performance of the teacher assessed by the students? If yes, are the feedback reports analysed and suggestions communicated to teachers?**

Yes

**2) Number of teachers getting** a) Very Good\_\_\_\_b) Good 100%

c) Average\_\_\_\_\_remarks from students.

**3) Whether suggestion boxes are kept in the department to get suggestions from**

**students on infrastructural facilities available in the department?**

No

**4) Are the suggestions received from students used for improvement of facilities?**

Yes

**5) Do teachers submit Self-Appraisal Reports? Are these reports appraised by HOD and forwarded to the university with comments?**

Yes

**6) What is the individual faculty wise h index? -**

**7) Give details of “beyond syllabus scholarly activities” of the department. -**

Department celebrates functions like ONAM, Christmas, etc. and involve in other cultural programs. Faculty members are involved in the Editorial work of journals in Statistics and related areas. Faculty give advice to students/research scholars of other Department/Institutions for carrying out Statistical Analysis

**49. List the distinguished alumni of the department (maximum 10)**

1. Dr. K.X. Joseph, former Professor and Head, Department of Economics, University of Calicut.
2. Dr. N. Raju, former Professor and Head, Department of Statistics, University of Calicut.
3. Dr. A.P . Kuttykrishnan, former Pro Vice Chancellor, Kannur University.
4. Dr. Sathianandan, CMFRI, Kochi.
5. Dr. Sreedharan, CWRDM, Calicut.

**50. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.**

See answer to item number 32

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

Through continuous evaluation process

**52. Highlight the Special facilities (if, any) of the Department. ---**

**53. Highlight the unique features of the department. ----**

**54. State the Innovative practices adopted in the department. ----**

**55. Highlight the participation of students and faculty in extension activities.**

Faculty and the students has been involving in extension activities like coaching for UGC/CSIR NET, organising seminars/workshops etc.

**56. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.**

- a. Strengths:-** Highly Qualified Faculty, Good Library, Good Computational facility, Good reputation (National & International), High Quality research.
- b. Weaknesses:-** Lesser number of teaching faculty, Placement of students in reputed firms/companies, students progression to higher studies, Lesser number students qualified in competitive exams.
- c. Opportunities:-** Plenty of job and research opportunities in Statistics, Diversified growth of Statistics, Collaborations at National/International level, Applications in Industry/Analytics, Statistical Consultancy.

**d. Challenges:** - Keeping up the syllabus, Getting industrial support, set up infrastructural facilities and promote research and training at par with international standards.

**57. Future plans of the department:**

- \*To Provide statistical computing facility to the staff/Research scholars/students of the University including Biological Science, Mathematical Science, Education, Psychology. etc.
- \* To conduct training programmes in data analysis and statistical computing to staff/Research Scholars/students of the University.
- \* To conduct Diploma/Certificate courses in statistical computing to any graduate.
- \* To conduct evening courses on data analysis to staff/Research Scholars/Students of the campus as well as the employees from industry and other firms.

**Declaration by the Head of the Department/Institution:**

**I am aware that the above information provided by the department will be validated by the AAA committee during the visit.**

Sd/-

**Head of Department**

**Date: 23.6.2020**

## BRIEF CURRICULUM VITAE

Dr. C. Chandran

Professor

Department of Statistics

University of Calicut

Kerala, 673635

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- PERMANENT ADDRESS

Dr. C. Chandran

Cherualath House

Muthuvannacha Post

Kuttiadi Via

Kozhikode Dist

673508

- EDUCATIONAL QUALIFICATIONS

MSc Statistics (CUSAT, 1985)

MPhil Statistics (Pune, 1990)

Ph D (Sheffield, U K, 1999)

Postdoc (Sheffield, U K, 1999-2000)

- RESEARCH INTERESTS

Probability Modeling

Statistical Inference

Extreme Value Modeling

- **ACADEMIC DISTINCTIONS**

Commonwealth Academic Staff Scholarship, 1995, U K

NBHM Research Award, 1988

National Merit Scholarship, 1983-85

State Merit Scholarship, 1980-83

- **POSITIONS HELD**

Professor, Department of Statistics, University of Calicut, 2009 till date

Lecturer, Department of Statistics, University of Calicut, 1991-2008

Statistical Assistant, University of Calicut, 1986-1988

- **TEACHING/RESEARCH EXPERIENCE**

30 years of teaching and research

- **Ph D/MPhil**

Number of Ph D Students Completed : 3

Number of MPhil Students Completed : 7

Number of Ph D Students working : 5

Number of MPhil Students working: 2

- **MEMBERSHIP IN PROFESSIONAL BODIES**

Life member, Indian Society for Probability and Statistics

Life member, Kerala Statistical Association

- **MEMBERSHIP IN ACADEMIC BODIES**

Member, PG Board of Studies in Statistics, Calicut University

Member, PG Board of Studies in Statistics, Kerala University

Member, PG Board of Studies in Statistics, Kannur University

Worked as Head of the Department, Department of Statistics, Calicut University

Worked as Chairman, PG board of Studies in Statistics, Calicut University

Worked as Member of Senate, Calicut University

Worked as Member of Academic Council, Calicut University

Worked as Member of Faculty of Science, Calicut University

- PUBLICATIONS/RESEARCH REPORTS (Latest)

Chandran, C. (with Aparna Aravindakshan), (2019). On the Extrema of Observations from Certain Families of Distributions, Communicated.

Chandran, C. (with Aparna Aravindakshan), (2017). On the Characteristic Function of Extrema with Some Applications, ProbStat Forum, Vol 10, 85-93.

\* \* \*

## Curriculum Vitae

**Name:** :Dr. K. JAYAKUMAR

**Address:** :Professor & Head, Department of Statistics, University of Calicut.

**Permanent Address** :III/260, Kausthubham, Kottappady P.O., Guruvayoor-680505, Thrissur.

**Date of Birth** : 27.05.1965

**Educational Qualifications** : MSc, M.Phil. & Ph.D.

**PG Teaching Experience** : 25 years

**Research Experience** : 30 years

### **Positions Held:**

<b>Sl. No.</b>	<b>Positions Held</b>	<b>Period</b>
<b>1.</b>	<b>Professor, Department of Statistics, University of Calicut</b>	<b>From September, 2011 onwards</b>
<b>2.</b>	<b>Associate Professor</b>	<b>26.9.2008 to 25.9.2011</b>
<b>3.</b>	<b>Assistant Professor</b>	<b>19.9.1996 to 25.9.2008</b>
<b>4.</b>	<b>Research Officer, Department of Economics &amp; Statistics, Govt. of Kerala</b>	<b>April to September 1996</b>
<b>5.</b>	<b>Head, Marketing Research Unit, Mathrubhumi, Calicut</b>	<b>February to April 1996. Also, worked as Consultant to Mathrubhumi Daily during 1997-99.</b>
<b>6.</b>	<b>Head, Department of Statistics, University of Calicut</b>	<b>More than 5 years (2008-2010; 2014-2016; 2019-...)</b>



### **Awards and Honours:**

- **2012- Best Research Paper award**, Instituted by King Saud University, Saudi Arabia.
- **1999- Post Doctoral Fellowship** at Division of Community Medicine, Memorial University of Newfoundland.
- **1997-Post Doctoral Fellowship** at Department of Mathematics, Statistics and Computing Science at Dalhousie University, Canada.
- **1995-Jan Tinbergen award** for Young Statisticians from Developing Countries, Instituted by the International Statistical Institute, Netherlands.
- **1995-NBHM Award for Post Doctoral Research**. Work carried out in CUSAT.
- **1991-CSIR Senior Research Fellowship**. Work carried out in University of Kerala.

### **Areas of Specialization:**

**Distribution Theory, Time Series Analysis & Forecasting, Statistical Inference, Stochastic Modeling & Probability Theory**

### **Research Collaborations :**

<b>Research Collaborations (Evidenced in terms of Joint Research Publications)</b>		
<b>Sl.No.</b>	<b>Name of University</b>	<b>Name of Faculty Associated</b>
<b>1</b>	<b>University of Nis, Serbia</b>	<b>Prof. Miroslav M. Ristic</b>
<b>2</b>	<b>University of Indianapolis, USA</b>	<b>Prof. Nadjib Bouzar</b>
<b>3</b>	<b>University of Manchester, UK</b>	<b>Prof. Saralees Nadarajah</b>
<b>4</b>	<b>University of Nevada at Reno, USA</b>	<b>Prof. T.J. Kozubowski</b>
<b>5</b>	<b>Dalhousie University, Canada</b>	<b>Prof. R.P. Gupta</b>
<b>6</b>	<b>University L.Baconi, Italy</b>	<b>Prof.M. Cifarelli</b>
<b>7</b>	<b>King Saud University, Saudi Arabia</b>	<b>Prof. Hassan Bakouch</b>
<b>8</b>	<b>IIM, Kozhikkode</b>	<b>Prof. R.P. Surseh</b>
<b>9</b>	<b>CUSAT, Kochi</b>	<b>Prof. P.G. Sankaran Prof. N. Balakrishna</b>

### **Membership in Scientific Bodies:**

- **Life Member, Indian Society of Probability and Statistics**
- **Life Member, Kerala Statistical Association.**
- **Member, International Indian Statistical Association.**
- **Member, Bernoulli Society**
- **Member, ISBIS, ISI, Netherlands**

### **Professional Leadership:**

- **President, Kerala Statistical Association- 2016-19**
- **General Secretary, Kerala Statistical Association- 2007-2012.**

**Number of Ph.D. Thesis Supervised: 10 (Ten)**

**Number of M.Phil. Dissertations Supervised: 6 (Six)**

**Number of Ph.D. Students Working: 7 (Seven)**

**Number of M.Phil. Students Working: 2 (Two)**

### **Editorial Works:**

- **Chief Editor - Journal of the Kerala Statistical Association (founded in 1978 : ISSN 2249-4553)**
- **Editor – STARS International Journal (ISSN 0973-7804 )**

### **Review Works Undertaken:**

- **Reviewer of Mathematical Reviews of American Mathematical Society.**
- **Reviewer of the Journals –**
  - a) Communications in Statistics- Theory & Methods- Taylor & Francis;
  - b) Communications in Statistics -Simulation & Computation- Taylor & Francis;

- c)Journal of Multivariate Analysis- Elsevier;
- d)Statistica- University of Bologna, Italy;
- e) Test- Springer;
- f)Statistical Papers- Springer;
- g)Journal of Statistical Computation and Simulation- Taylor & Francis, etc.

### **Research Thesis Evaluation**

- External Examiner for Evaluation/Chairman: **More than Twenty PhD Thesis.**

### **Membership in Academic Bodies:**

- Member, Academic Council, University of Calicut- (for Five years)
- Chaiman, PG Board of Studies in Statistics, University of Calicut
- Member, PG BoS in Bharathiar University
- Member, PG BoS in Kannur University
- Member, PG BoS in University of Kerala
- Member, PG BoS in Christ College (Autonomous), Irinjalakkuda
- Member, Scientific Advisory Committee, Malabar Cancer Centre, Thalasserry.
- Member, CCSS Academic Committee, University of Calicut.

**Number of Research Papers Published (National/International):** 110.

**Number of Papers Presented/Invited Talks/Lectures Delivered:** 250.

### **Visits Abroad for Academic Purposes:**

Canada, Australia, Switzerland, Singapore, Germany, Portugal & Newfoundland.


### **Research Publications during the last two years (2019 & 2020).**

1. A generalization of Inverse Marshall-Olkin family of Distributions. Journal of Data Science, Vol.18, pp 1-43 (2020)

2. Heavy tailed Pareto Distribution: Properties and Application, (Accepted in Journal of Data Science in 2020)
3. On estimation of Geometric Stable Distributions. Journal of the Indian Society for Probability and Statistics, (Accepted in 2020).DOI: 10.1007/s 41096-020- 00085-9
- 4 On a new generalization of Pareto distribution and its applications. Communications in Statistics-Simulation and Computation, Vol. 49, pp. 1264-1284 (2020)
5. q-Gompertz Distribution and its applications. Applied Statistical Techniques and Stochastic Modelling. Edited by Nicy Sebastian and Sajesh T.A., pp. 35- 48 (2020)
- 6 Exponential Intervened Poisson Distribution. Communications in Statistics – Theory and Methods.(Accepted). DOI: 10.1080/ 03610926.2019. 1682161 (2019)
- 7 On a generalized class of Weibull distributions and its applications. Journal of the Kerala Statistical Association, Vol. 30, pp 21-46 (2019)
- 8 Discrete Additive Weibull Geometric Distribution ,Journal of Statistical Theory and Applications, Vol. 18, pp. 33-45 (2019)
- 9 Discrete Linnik Weibull distribution, Communications in Statistics - Simulation and Computation, Vol. 48, pp. 3092-3117 (2019)
- 10 A New Generalization of the Frechet Distribution: Properties and Application, Statistica, Vol. 79, pp. 267 -289 (2019).

### **Declaration**

**I hereby certify that the information given above are true to the best of my knowledge and belief.**



**Prof. K. Jayakumar**

### **Format for preparing the faculty profile:**

(Provide the information for last five years from 2016-17 to 2020-21)

1. Name of the faculty: **Dr. Dileepkumar M**
2. Name of the Department: Statistics
3. Educational qualifications: M.Sc. Ph.D.
4. Present position: Assistant Professor.
5. Address for correspondence: Ponari house, Nuchyadukunnu, Vattyara, Payam East P.O, Kannur, 670704.
6. E-mail and contact number: [drdileepkumar@uoc.ac.in](mailto:drdileepkumar@uoc.ac.in), 9526606287.
7. Specialization: Reliability Theory, Survival Analysis, Distribution Theory and Non-parametric Inference.
8. Total teaching experience: 2 years.
9. Courses taught: Statistical Inference-I, Statistical Inference-II, Mathematical methods – I, Regression Analysis, Distribution Theory.
10. Research experience: 6 years.
11. Major research projects completed: Title of the project, Date of sanction and Duration, Grant received, Funding agency. PI or Co-PI. **Nil**
12. Minor research projects completed: Title of the project, Date of sanction and Duration, Grant received, Funding agency. PI or Co-PI. **Nil**
13. Number of students awarded Ph.D. degree: Name of the student, topic of research, date of registration, date of declaration of Ph.D. degree. **Nil**
14. Number of students registered for Ph.D. degree: Name of the student, topic of research, date of registration. **Nil**
15. Provide information as indicated in 11 and 12 above. **Nil**
16. Participation in conferences, symposia, seminars and workshops: International, national, state or university level, attended. Presented paper, chaired session. Resource person.  
  
See Enclosure - III
17. Innovative processes developed in teaching and learning.

Used Moodle, Google classroom, Google meet and Zoom platforms for efficient online teaching.

18. Participation in curricular development:

19. Participation in co-curricular and extra-curricular activities.

Department Co-Ordinator, IQAC (Internal Quality Assurance Cell), University of Calicut.

20. Refresher and Orientation courses attended: **Nil**

21. Examination /Evaluation reforms initiated:

Online examinations have been conducted for M.Sc. students.

22. Publication of research papers: in peer reviewed journals, non-peer reviewed journals, conference proceedings, impact factors, citations, h-index. Numbers in SCOPUS.

**See Enclosure IV**

23. Books published: with ISBN No., Without ISBN No., Chapters in books. **Nil**

24. Patents Applied/Granted: National. International, commercialized: **Nil**

25. Consultancy services provided and revenue generated: **Nil**

26. Conferences, seminars, symposia and workshops organized as convener/coordinator: Nil

27. Number of collaborations: **Nil**.

28. Awards /recognitions received: International, National, State, University level.

A.R KAMMATH award for the **Best Indian Ph.D. thesis-2019** by the **Indian Society for probability and Statistics**.

Note: If necessary, for Item No. 11 and 12 provide information in Enclosure-I, for 13, 14 and 15 Enclosure- II, for 16 Enclosure-III, for 22 and 23 Enclosure- IV and so on.

### **Enclosure-III**

1. Presented a paper entitled “A new quantile function with applications to reliability analysis”, in the 39th annual convention of ISPS Organized by the department of statistics, Utkal University, Bhubaneswar, December 21-23, 2019.

2. Presented a paper entitled “A class of distributions with the quadratic mean residual quantile function”, in the International Conference on Theory and Applications of Statistics and Information Sciences (TASIS-2018). Organized by the Department of Statistics, Bharathiar university, Coimbatore, January 5-7, 2018.
3. Presented a paper entitled “A new quantile function with application to reliability analysis”, in the National conference on Advances in Statistical Methods. Organized by the Department of Statistics, Kannur university, Kannur, November 8-10, 2018
4. Presented a paper entitled “Proportional odds model- A quantile approach”, in the Fourth International conference on Statistics for Twenty-First Century-2018 (ICSTC-2018). Organized by the department of statistics, University of Kerala, Trivandrum, December 13-15, 2018.

#### Enclosure IV

1. **Dileep Kumar, M.**, Sankaran, P. G., and Nair, N. U, Bayesian inference in quantile functions. Communications in Statistics-Theory and Methods, Doi: <https://doi.org/10.1080/03610926.2020.1827430>, 2020.
2. **Dileep Kumar, M.**, Sankaran, P. G., and Nair, N. U., Proportional odds model-a quantile approach. Journal of Applied Statistics, 46.11, 2019.
3. **Dileep Kumar M**, P. G. Sankaran, A Class of Quantile Functions with Applications to Reliability Analysis, Communications in Statistics-Theory and Methods, 1-22, 2019.
4. Sankaran, P. G., Isha Dewan, and **Dileep Kumar, M.** The cause specific hazard quantile function. Austrian Journal of Statistics, 56-69, 48(1), 2019.
5. **Dileep Kumar, M.**, Sankaran, P. G., and Nair, N. U. Quantile based relevation transform and its properties. Statistica, 78.3: 197-214, 2018.
6. Sankaran, P. G., and **Dileep Kumar, M.** Reliability properties of proportional hazards relevation transform. Metrika 1-16, 2018.
7. Sankaran, P. G., and **Dileep Kumar, M.** A class of distributions with the quadratic mean residual quantile function. Communications in Statistics-Theory and Methods 1-22, 2018.
8. Sankaran, P. G., and **Dileep Kumar, M.** A new class of quantile functions useful in reliability analysis. Journal of Statistical Theory and Practice 1-20, 2018.

Sankaran, P. G., and **Dileep Kumar, M.** Power-Pareto quantile function. Journal of Applied Probability and Statistics 13(1):81-95, 2018.

\*\*\*\*\*

## Format for preparing the faculty profile:

(Provide the information for last five years from 2016-17 to 2020-21)

1. Name of the faculty: **Dr. M. Manoharan**
2. Name of the Department: Department of Statistics
3. Educational qualifications: M.Sc. (Statistics), Ph.D.
4. Present position: Professor & Member Syndicate
5. Address for correspondence: Krishnapadam (H), Thenhippalam (P.O.),  
Malappuram (Dt.), Kerala – 673 636
6. E-mail and contact number: cue2211@uoc.ac.in
7. Specialization:  
  
Stochastic Models in Queues, Inventory and Reliability; Phase type distribution; Survival Analysis, Longitudinal Analysis and Inferential problems associated with all of these topics, Supply Chain Processes and Official Statistics.
8. Total teaching experience: 30 years.
9. Courses taught (during last five years):  
  
Taught courses/papers on Regression Methods, Design of Experiments, Sampling theory, Stochastic Processes, and Lifetime Data Analysis for M.Sc. Statistics Programme.  
  
Taught the courses on Research Methodology, Advanced Trends in Statistics, Reliability Modeling, Queueing Models & Methods, Advanced Queueing Theory, Longitudinal Data Analysis, Official Statistics, Stochastic Models in Queueing Theory, Modeling and Analysis of Inventory for M.Phil./Ph.D. programme in Statistics.
10. Research experience: 35 years  
Major research projects completed: Title of the project, Date of sanction and Duration, Grant received, Funding agency. PI or Co-PI. :  
Title of Project: '*Identifiability on Queueing Models*'. Period: 16-10-2006 to 15-10-2009 (3 years) Research Grant of Rs. 9,77,769/- under the UGC Research Award Scheme.
11. Minor research projects completed: Title of the project, Date of sanction and Duration, Grant received, Funding agency. PI or Co-PI.: Nil
12. Number of students awarded Ph.D. degree: Name of the student, topic of research, date of registration, date of declaration of Ph.D. degree.:  
  
Total -13 (Thirteen); During the last five years period: **3 (Three)**      **See Enclosure-I**



**13.** Number of students registered for Ph.D. degree: Name of the student, topic of research, date of registration.: **8 (Eight) See Enclosure-I**

**14.** Participation in conferences, symposia, seminars and workshops: International, national, state or university level, attended. Presented paper, chaired session. Resource person.:  
**See Enclosure- II**

**15.** Innovative processes developed in teaching and learning:

Developed a couple of courses for M.Sc. Statistics Programme on Moodle Platform for online teaching during the academic years 2019-20 & 2020-21.

**16.** Participation in curricular development:

- a. Coordinator of Choice-Based Credit Semester System (CCSS), Post-graduate Programmes, University of Calicut during the term 26.08.2016 to 20.12.2019 (3 years).
- b. Director IQAC (Internal Quality Assurance Cell), University of Calicut from 01.04.2017 to 19.12.2019 (2 years & 8 months)

External Examiner for Ph.D. Thesis: 5 (five).

Referee work for:

- Journal of Indian Statistical Association
- Journal of Quality Technology & Quantitative Management (QTQM)
- Reliability Engineering and System Safety (Elsevier)
- Journal of the Indian Society for Probability and Statistics.
- ProbStat Forum-An e-journal in Probability, Statistics and Optimization.

**17.** Participation in co-curricular and extra-curricular activities:

- Delivered a lecture on “New Framework of NAAC Reaccreditation” to the staff members of KAHM Unity Women’s’ College, Manjeri, Malappuram (Dt.), Kerala on 20<sup>th</sup> February 2018.
- Delivered Keynote Address on “A Roadmap to Assessment and Accreditation”, in the One-Day State Level Workshop organized by the IQAC, Amal College of Advanced Studies, Nilambur, Kerala on 03<sup>rd</sup> March 2018.
- Officiated as observer for the conduct of CMAT and GPAT- 2016 & 2017 conducted by AICT, Govt. of India.
- Worked as an External Expert for the Academic Audit of the Department of Statistics, CUSAT conducted on 25.01.2018
- Acted as a member in Administrative Audit Committee of SREE SANKARACHARYA UNIVERSITY OF SANSKRIT, KALADY in 2019.

**18. Refresher and Orientation courses attended:**

- Resource person in a number of Refresher Courses for College/ University teachers **organised by UGC-ASCs at various universities in India.**
- Attended Two-Weeks Online Hands on Training Programme on Learning Management System 'Moodle' organized by the Department of Computer Science & IQAC, University of Calicut, from 25-05-2020 to 09-06-2020.

**19. Examination /Evaluation reforms initiated:**

Open-book examination has been conducted at M.Sc. and M.Phil. level.

**20. Publication of research papers: in peer reviewed journals, non-peer reviewed journals, conference proceedings, impact factors, citations, h-index. Numbers in SCOPUS:**

**See Enclosure- III**

**21. Books published: with ISBN No., Without ISBN No., Chapters in books.:**

**See Enclosure- III**

**22. Patents Applied/Granted: National. International, commercialized: Nil**

**23. Consultancy services provided and revenue generated: Nil**

**24. Conferences ,seminars, symposia and workshops organized as convener/coordinator:**

- Induction Programme for the First Semester PG Students (2018 Admn) of the University Teaching Departments, 02<sup>nd</sup> August 2018, EMS Seminar Complex, UoC.
- Two Day Workshop on RAF of NAAC and Quality Systems in Higher Education, 05 & 06 March 2019, C. U. Campus under the auspices of IQAC, UoC.
- Induction Programme for the First Semester PG Students (2019 Admn) of the University Teaching Departments, 18<sup>th</sup> June 2019, EMS Seminar Complex, UoC.
- Workshop on University-Industry Collaboration, 13<sup>th</sup> November 2019, Senate House, UoC.

**25. Number of collaborations: 3 nos. See Enclosure- IV**

**26. Awards /recognitions received: International, National, State, University level.**

- Nominated to the National Collegium of Assessors of the National Assessment and Accreditation Council (NAAC), Bengaluru, India in March 2018.
- Appointed as the UGC SWAYAM Coordinator (USC) at the University of Calicut w.e.f. 21.01.2018
- Member of the Syndicate, University of Calicut w.e.f. 07.06.2019

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## Enclosure- I

- (a) Number of students awarded Ph.D. degree during the last five years: Name of the student, topic of research, date of registration, date of declaration of Ph.D. degree. : **3 (Three)**

1. **Abdul Rasheed, K.V.** (Date of Award: 11-01-2016.)

The University of Calicut (Ref. No. 128463/RESEARCH-C-ASST-1/2015/Admn dtd 11.02.2016)

Title of Thesis: A Study on Queueing Models with Server Regulation.

2. **Sreekala, M.S.** (Date of Award: 08.02.2017)

The University of Calicut (Ref. No. 148454/RESEARCH-C-ASST-1/2016/Admn dtd 06.03.2017)

Title of Thesis: *Study on Queueing Networks and their Applications.*

3. **Vidhya G. Nair** (Date of Award: 06.12.2019)

The University of Calicut (Ref. No. 254932/RESEARCH-C-ASST-1/2018/Admn dtd 07.01.2020)

Title of Thesis: *Contributions to Stochastic Modelling in Reliability.*

- (b) Number of students registered for Ph.D. degree (during the last five years):

Sl. No	Name of the student	Topic of research	Date of Registration
1	Kavya P	Contribution to the study on aging of life distributions based on failure rate and applications.	13/07/2017
2	Praveen V P	Study on inventory control under uncertainty in supply chain processes	13/07/2017
3	Prasily P	Some Contributions to official Statistics	13/07/2017
4	Salima P	A study on some generalized queueing systems and their applications.	17/04/2019
5	Nimisha M	Study on some general queueing networks and their applications	16/05/2019
6	Arya Damodharan	Study on inventory control in multi-stage, multi-product stochastic production inventory models and their application.	16/05/2019
7	Greeshma Chandran	Study on Reliability Analysis of Multi-state Systems and their Applications	27/01/2020
8	Anjale Ramesh	Stochastic modeling and Analysis of Some Generalized Queueing Networks and their Applications	02/06/2020

## **Enclosure- II**

**Participation in conferences, symposia, seminars and workshops: International, national, state or university level, attended. Presented paper, Chaired session. Resource person:**

1. Second International Symposium on Stochastic Models in Reliability Engineering, Life Science and Operations Management (SMRLO'16), SCE, Beer Sheva, Israel, February 15-18, 2016. Plenary Talk: 'Stochastic Modeling of Multistate Disease Dynamics under Random Environments'.
2. Participated in the 'Training Program on Financial Administration' conducted by the UGC-HRDC, University of Calicut on 24-9-2016.
3. Two Days Workshop on 'Random Processes and Applications' held at MES College of Engineering, Kuttippuram on 26th & 27th October 2016, Delivered invited lectures on "Queueing Theory".
4. Participated and Chaired a technical session in the National workshop on Emerging trends in Information Technology in University Management held during December 14-16, 2016 at University of Calicut, Kerala organized by Association of Indian Universities (AIU) New Delhi.
5. National Seminar on Statistical Methods and Applications, 15-17 Dec. 2016, Dept. of Statistics, Govt. Arts & Science College, Calicut, Keynote Address: "Identifiability of queueing systems through some steady-state characters".
6. Second International Conference on Statistics for Twenty-first Century-2016 [ICSTC-2016], 21-23 December 2016, University of Kerala, Thiruvanthapuram, Invited Talk: "PH Distributions and MAPs in Stochastic Modeling-Some Inferential Aspects".
7. Delivered invited talk on 'Towards a career in Statistics 'in the Programme on Awareness in Statistics for Plus 2 students 'held on 11 Jan 2017, organized by the Department of Statistics, Farook College, Kozhikode.
8. Attended the Workshop on 'RUSA and GENDER ATLAS' organized by RUSA State Project Directorate at Forest Research Institute, Peechi, Thrissur during 27-28 Jan 2017.
9. Attended National Conference on Advances in Statistical Sciences in conjunction with the Annual Conference of KSA, 17-18 Feb 2017 held in Department of Statistical Sciences, Kannur University, Kerala. Presented an Invited Talk entitled 'A Medical Application of Semi-Markov Decision Process'.
10. Attended (as RUSA co-ordinator, University of Calicut) the workshop on 'FUND TRACKING SYSTEM' conducted by the RUSA state project Directorate od EDUSAT studio, Thiruvananthapuram on 22-02-2017.
11. Attended the National Seminar on 'Statistical Techniques in Applied Areas' organized by Research and PG, Department of Statistics, St. Thomas College (Autonomous), Thrissur, 27-28 February 2017 and delivered an Invited Talk on 'Statistics and Data Science'.

12. Participated in the 2017 IISA International Conference on Statistics held at HICC, Hyderabad, India, on December 28-30, 2017. Organized a session titled "4343: Advances in Queuing Theory and Applications" and also delivered an invited talk on "Identifiability of Queuing Systems - Some Recent Developments" on 30.12.2017.
13. Delivered an Invited Talk on "Advances in Queueing Networks: Applications in Health Care System" at the International Conference on Recent Advances in Statistical Methodology with Applications in Clinical and Official Statistics, organized by the Dept. of Statistics, St.Thomas College, Palai in collaboration with Christian Medical College, Vellore and University of Maryland, USA during 03-05 January 2018.
14. Participated in the NAAC & CUTN Sponsored Two-Day National Workshop on "Quality Assurance and Sustenance: Need for Strategic Planning" organized by the IQAC of Central University of Tamil Nadu, Thiruvavur on 05.01.2018 and 06.01.2018.
15. Participated in the International Conference on Theory and Applications of Statistics and Information Sciences as a delegate and delivered an Invited Lecture entitled "On Restricted Queueing Networks" held at the Dept. of Statistics, Bharathiar University, Coimbatore, January 5-7, 2018.
16. Participated in the 'One Day Orientation Workshop on the Roles and Responsibilities of the University and its Swayam Coordinators' held on 02 Feb. 2018 at the AICTE Office, Nelson Mandela Marg, Vasant Kunj, New Delhi.
17. Participated and delivered an Invited Talk entitled- "Operational and Economic Analysis of Queueing Systems" in the National Seminar on Innovative Approaches in Statistics (in conjunction with the Annual Conference of the Kerala Statistical Association) organized by the Dept. of Statistics, St. Thomas College (Autonomous), Thrissur, 15-17 February 2018.
18. Participated and delivered an Invited Talk entitled – "A complex survival model under random environment" in the National Seminar on Statistics and New Directions organized by the PG & Research Department of Statistics, Farook College (Autonomous), Kozhikode during 7-8 March 2018.
19. Participated in the National Seminar on Statistical Modelling and Data Analytics (NSSMDA-2018) held during 19-20 March, 2018 in the Department of Statistics, University of Madras, Chennai. Delivered invited talk on the topic- 'On optimal warranty policy with preventive maintenance for product /system under phase-type life distribution' on 19.03.2018.
20. Participated and presented a paper entitled – "An Approximate Method for Open Restricted Queueing Networks" in the International Conference on Advances in Applied Probability and Stochastic Processes organized by the Centre for Research in Mathematics, CMS College Kottayam during January 7 to 10, 2019.
21. Participated in the National Conference on Statistical Theory, Modeling and Application held at the Dept. Statistics, Bharathiar University, Coimbatore, Tamil Nadu during March 14-15, 2019 and delivered an invited lecture entitled –"A Warranty Policy for Product/System having General Life Time Distribution".

22. Participated in the ‘National Webinar on the Role of Statistics in Clinical Research’ organized by the PG & Research Department of Statistics, Farook College (Autonomous) held on 19-10-2020.
  23. Participated in the ‘National Webinar on Connecting the World with data we can trust’ organized by the Department of Statistics, University of Calicut on 20-10-2020.
  24. Participated in the “Assessors’ Orientation Programme (Southern Region)” conducted by NAAC, Bengaluru during March 21-22, 2018.
- Delivered Special Lectures on ‘Stochastic processes and Models’ and ‘Phase Type Distributions and Properties’ on 03rd& 04th March 2016 at the Department of Studies in Statistics, Karnatak University, Dharwad, Karnataka.
  - Delivered Invited lectures on Queueing Theory I and II at the Dept. of Mathematics, MES College of Engineering, Kuttippuram on 26-10-16 & 27-10-16.
  - Delivered Special Lectures on “Stochastic Processes and Models; PH Distribution and its Properties”, at Karnatak University, Dharwad, Dept. of Studies in Statistics on 03-03-16 & 04-03-16.
  - Attended the UGC-HRDC as a Resource Person on 17.6.2017 and delivered a lecture on the topic ‘Statistics and Data Science’ to the participants of UGC sponsored Refresher Course in Basic Science conducted during 15.6.2017 to 5.7.2017.
  - Resource person in the short run course of MHRD- Teaching Learning Centre held at the Dept. of Education, University of Calicut during 21-25 August 2017 and handled a session on ‘Direct and Indirect Grading System’ on 21-08-2017.
  - Resource person in the short run course of MHRD- Teaching Learning Centre held at the Dept. of Education, University of Calicut in December 2017 and delivered a couple of invited talks on ‘Forces of Change in Higher Education’ on 20.12.2017.
  - Resource person for the short term course on “Academic Leadership” conducted UGC-HRDC of Aligarh Muslim University at MES Keveeyam College, Valacherry, Kerala and handled a class on the topic- “Revised Guidelines for NAAC Accreditation on 22.01.2018.
  - Resource person in the Three-day Workshop-cum- Seminar commemorating 75 years of the teaching M.Sc, Course, February 08-10, 2018 at the Department of Studies in Statistics, University of Mysore and delivered three scholarly talks in different sessions.
  - Engaged as a Resource person two sessions on “From Statistics to Data Science “on 05.03.2018 and another two sessions on “Introduction to Queueing Theory and its applications” in the special summer Refresher Course in Mathematical Sciences, organized by the UGC-HRDC, Kannur University, Kerala.
  - Delivered the “Prof. S.P. Rajagopalan Endowment Lecture 2017-’18” at the University of Madras on March 19, 2018 on the topic- ‘On optimal warranty policy with preventive maintenance for product /system under phase-type life distribution’.
  - Resource person in the Induction Programme of MHRD- Teaching Learning Centre, Dept. of Education, University of Calicut conducted from 02.05.2018 to 31.05.2018 and delivered a couple of invited talks on ‘CBCS and Academic Grading’ on 30.05.2018.
  - Delivered a couple of lectures in the a.n. session of 07.06.2018 to the participants of Refresher Course in Statistics and Research Methods: 24.05.2018 to 13.06.2018 for teachers from Universities and Colleges across India, conducted by the HRDC, University of Kerala, sponsored by UGC (Topics: Computational Probability & Phase-Type Distribution).

- Webinar talk on ‘UGC-NAAC accreditation strategies in institutions’ organized by the IQAC, MES College, Erumeli, on 16-06-2020.

### **Extension Lectures:**

- **Delivered a lecture** on “**New Framework of NAAC Reaccreditation**” to the staff members of KAHM Unity Women’s’ College, Manjeri, Malappuram (Dt.), Kerala on 20<sup>th</sup> February 2018.
- **Delivered Keynote Address** on “**A Roadmap to Assessment and Accreditation**”, in the One-Day State Level Workshop organized by the IQAC, Amal College of Advanced Studies, Nilambur, Kerala on 03<sup>rd</sup> March 2018.

### **Enclosure- III**

**Publication of research papers: in peer reviewed journals, non-peer reviewed journals, conference proceedings, impact factors, citations, h-index. Numbers in SCOPUS:**

1. **'Markovian Queueing System with Discouraged Arrivals and Self-Regulatory Servers' (2016)**, (jointly with K.V. Abdul Rasheed), *Advances in Operations Research*, Vol. 2016, Article ID: 2456135, 11 pages, <http://dx.doi.org/10.1155/2016/2456135>. ISSN:1687-9147E-ISSN:1687-9155, Scopus Indexed, CiteScore : 0.8
2. **'Stochastic Modelling of Multistate Disease Dynamics under Random Environments'(2016)**, (jointly with Xavier, T.D.), *Proceedings of the Second International Symposium on Stochastic Models in Reliability Engineering, Life Science and Operations Management (SMRLO'16, 15-18 Feb.2016, Beer Sheva, Israel)*, IEEE Computer Society-CPS, New Jersey, pp. 393-402. 978-1-4673-9941-8/16\$31.00 ©2016 IEEE, DOI 10.1109/SMRLO.2016.69.
3. **‘An Application of Restricted Open Queueing Networks to Healthcare Systems’ (2016)**, (jointly with M.S. Sreekala), *International Journal of Latest Trends in Engineering and Technology (IJLTET)*, 7(1), 103-113. ICV:77.02/100 Global IF:0.685/1; eISSN 2278-621x, pISBN-2319-3778.
4. **‘Analysis of Restricted Queueing Networks – A Blocking approach’ (2016)**,(jointly with M.S. Sreekala), *Journal of Statistical Science and Application (JSSA)*, 4, No. 09-10, 220-230 doi: 10.17265/2328-224X/2016.0910.003; GI & QF-2014:0.571.
5. **‘Beta Half Logistic Distribution – A New Probability Model for Life Time Data’ (2016)**, (jointly with Joby K. Jose), *Journal of Statistics and Management Systems*, Vol.19 (4), 2016, pp587-604, pISSN:0972-0510, eISSN:2169-0014 Taylor & Francis online <http://dx.doi.org/10.1080/09720510.2015.1103457>. Web of Science ESC Indexed.
6. **‘A Queueing Network Model with Feedback and its Application in Healthcare’ (2016)** (jointly with M.S. Sreekala), *International Journal of New Technologies in Science and Engineering*, 3, Issue. 12, 78-89, ISSN 2349-0780. Available online @ [www.ijntse.com](http://www.ijntse.com), Tech IF:6.01.

7. **‘Analysis of Restricted Queuing Networks – A Blocking approach’ (2016)**, (jointly with M.S. Sreekala), *Journal of Statistical Science and Application (JSSA)*, **4**, No. 09-10, 220-230 doi: 10.17265/2328-224X/2016.0910.003; GI & QF-2014:0.571.
8. **“The Forces of Change in Higher Education” (2017)**, University News – A Weekly Journal of Higher Education (special issue published by AIU).Volume-55 No.51 December 2017, page 41-45, ISSN-0566-2257.
9. **‘Evaluation of System Performance Measures of Multi-State Degraded System with Minimal Repair’ (2017)**, (jointly with Vidhya G. Nair). *Reliability Theory & Applications*, No.1. (44) Vol.12 March 2017, pp 76-83. E-ISSN:1932-2321, Scopus Indexed.
10. **‘Infinite Divisibility of Some Steady State Queue Characteristics’ (2017)**, (jointly with Joby K. Jose). *Journal of the Indian Society for Probability and Statistics* (e-ISSN: 2364-9569) December 2017, Vol.18, Issue 2, pp 215–224, DOI 10.1007/s41096-017-0026-8 (Springer). Indexed in WoS-ESCI; UGC-CARE Listed.
11. **‘Dynamic Multi State System Reliability Analysis of Power Generating Systems using Lz-transform’ (2018)**, (jointly with Vidhya G. Nair), *ProbStat Forum- an e-journal in Probability, Statistics & Optimization*, **11**, 81-89, ISSN 0974-3235 (<http://www.probstat.org.in>).
12. **‘Birnbaum Joint Importance Measures for Multi-State System’ (2018)** (jointly with V. M. Chacko), *Vimala International Research Journal*, Vol-III, pp. 7-10.
13. **‘Reliability analysis of a multi state system with common cause failures using Markov Regenerative Process’ (2018)**, (jointly with Vidhya G. Nair). *Reliability Theory & Applications*, No.3. (50) Vol.13 September 2018, pp 82-88. Online ISSN 1932-2321. DOI: <https://doi.org/10.24411/1932-2321-2018-13006>, Scopus indexed.
14. **‘Bayesian estimation of queue parameters by bivariate prior distributions with order restriction’ (2018)**, (jointly with Joby K Jose), *Journal of the Indian Statistical Association*, Vol.56, No. 1 & 2, 2018, p29-46, ISSN 0537-2585, UGC-CARE Listed.
15. **‘Estimation of stress-strength reliability using discrete Phase Type distribution’ (2020)**, (jointly with Joby K Jose and Drisya, M.), *Communications in Statistics Theory and Methods (IF 0.612 )* DOI link: <https://doi.org/10.1080/03610926.2020.1749663> ISSN:0361-0926 E-ISSN:1532-415X, Scopus indexed.
16. **‘Reliability Analysis of Periodically Maintained Systems using Semi-Markov Processes based UGF Technique’ (2020)**, (jointly with Vidhya G Nair), *International Journal of Statistics and Reliability Engineering* , No.3. Vol.7, pp 326-330 December 2020. Online ISSN 2656-2378, pISSN 2350-0174, UGC-CARE listed.
17. **‘Reliability Analysis of a Repairable Parallel Multistate System based on Phase Type Distribution’ (2020)**, (jointly with Vidhya G Nair), *International Journal of Statistics and Reliability Engineering* , No.3. Vol.7, pp 408-412, December 2020. Online ISSN 2656-2378, pISSN 2350-0174, UGC-CARE listed.
18. **‘On Association in Time of Markov Processes with Application to Reliability and Survival Analysis’ (2021)**, (jointly with V M Chacko), *Statistics and Applications*, No.2. Vol.19, 2021. p101-111. Online ISSN 2452-7395. Indexed in WoS-ESCI, UGC-CARE.



**Books published: with ISBN No., Without ISBN No., Chapters in books:**

1. ‘**On a Generalized Lifetime Model Using DUS Transformation**’ (2020), (jointly with P. Kavya), *Applied Probability and Stochastic Processes*, V.C.Joshua et al. (eds.) Springer Nature Singapore Pte Ltd.2020. p281-291. Infosys Science Foundation Series, [https://doi.org/10.1007/978-981-15-5951-8\\_17](https://doi.org/10.1007/978-981-15-5951-8_17)
2. ‘**Analysis of Inventory Control Model for Items having General Deterioration Rate**’ (2020), (jointly with V.P. Praveen), *Applied Probability and Stochastic Processes*, V.C.Joshua et al. (eds.) Springer Nature Singapore Pte Ltd.2020. p293-306. Infosys Science Foundation Series, [https://doi.org/10.1007/978-981-15-5951-8\\_18](https://doi.org/10.1007/978-981-15-5951-8_18)

**Enclosure-IV**

**The following research projects on the themes of current trends in the subject are initiated to promote inter departmental/institutional research collaborations during 2020-21.**

Sl No	Principal Investigator	Collaborator	Themes/Title
1	Dr. M. Manoharan	Dr. Lajish, V.L Head, Department of Computer Science & Director Calicut University Computer Centre	Hidden Markov Models and Speech Analytics
2	Dr. M. Manoharan	Dr. Neeraj Misra Professor Department of Mathematics & Statistics, IIT Kanpur, Kanpur – 208016 (India)	System Signatures and Their Applications in Reliability
3	Dr. M. Manoharan	Dr. P. G. Sankaran Pro-Vice-Chancellor & Professor (on deputation) Department of Statistics Cochin University of Science & Technology, Cochin - 682022	Survival Analysis in Longitudinal Studies for Recurrent Events & Applications

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