Bachelor of Science (BSc)

Mathematics

The undergraduate course in Mathematics is designed to enable the students to lay a strong foundation in various fields of Mathematics. The course enables the students to develop a respectable intellectual level seeking to expose the various concepts in Mathematics. It also aims at enhancing the students reasoning, analytical and problem solving skills. The first four semesters are devoted to appreciate the beauty of mathematics through Introductory Algebra, Matrix Theory, Calculus, Differential Equations, Analytical Geometry and Vector Calculus. The open source mathematical package Scilab is introduced in the fourth semester to sensitize the students to the programming skills and visual treatment. Students find better perceptions of the classical papers like Abstract Algebra, Linear Algebra, Number Theory and Real and Complex Analysis in the fifth and sixth semesters. Fourier series and Integral Transforms and Numerical Analysis papers help the students to envisage an in depth knowledge of various numerical methods and integral transforms required in Scientific and Technological Applications.

Special features of UG/PG/ MPhil Programmes

- **UG Programmes**

The under graduate course in Mathematics enables the students to develop a respectable intellectual level seeking to expose the various concepts in Mathematics. It also aims at enhancing the students reasoning, analytical and problem solving skills. The course curriculum is comprehensive and includes 14 major papers covering all major topics in mathematics. The open source mathematical package Scilab is introduced to sensitize the students to the programming skills and visual treatment. Students will be accessible to variety of certificate courses like leadership skill, team building, anchoring, guidance and counseling, peer education system, accountancy, Indian cuisine, corporate international hospitality etc.

- **PG Programme**

MSc Mathematics course is designed to focus more on papers of two major research areas in Mathematics, viz, Graph Theory and Fluid Mechanics. The students who complete MSc Mathematics will get respectable intellectual level seeking to expose scientific research orientation in Mathematics. Students are accessible to do the internship in reputed institutions like TIFR, Indian Academy of Science, IISc etc. To enhance the teaching ability add-on courses are introduced in Teaching technology and Research Methodology in Mathematics, Introduction to Mathematical packages and Statistics. Students will be trained for NET examination.

- **MPhil Programme**

MPhil Programme in Mathematics has been designed to offer respectable research aptitude in four major areas in Mathematics viz, Fluid Mechanics, Graph Theory, Number Theory and Riemannian Geometry. This program is spread over two semesters with each semester consisting

of 15 weeks. The candidate has to submit the dissertation at the end of their study and appear for viva-voce examination.

Research Project:

- Dr. S. Pranesh has taken a Major Research Project from September 2010 for two and half years funded by Christ University on the topic "Study of electroconvection in micropolar fluid" .

Experts visited this year

- During the International Conference on "Emerging trends in fluid mechanics and graph theory" held on August 16-18, 2012 the following experts visited and enhanced our knowledge and wisdom.

Sl. No	Name	Address
1.	Dr. Akira Nakayama	Department of Mechanical Engineering, Shizuoka University, Hamamatsu, Japan.
2.	Dr. Pradeep G Siddheshwar	Department of Mathematics, Bangalore University, Central College Campus, Bangalore.
3.	Dr. Mayil Vaganan	Department of Applied Mathematics and Statistics, Madurai Kamaraj University, Madurai.
4.	Dr. M Subbaiah	Department of Mathematics, Pondicherry University, Pondicherry.
5.	Dr. Norihan Md Arfin	Department of Mathematics and Institute for Mathematical Research, Universiti Putra Malaysia, 43400 UPM Serdang, Selangoe, Malaysia.
6.	Dr. Mahesha Narayana	School of Mathematics, Statistics and Computer Science, University of Kwazulu-Natal Private Bag X01, Scottsville 3209, Pietermaritzburg, South Africa.
7.	Dr. R. N. Pralhad Kulkarni	Department of Applied Mathematics, DIAT, Pune.
8.	Dr. S. Saravanan	Department of Mathematics, Bharathiar University, Coimbatore, Tamil Nadu.
9.	Dr. M. Sankar	Department of Mathematics, East point College of Engineering and Technology, Bangalore.
10.	Dr. S. Manjunath	Department of Mathematics, BNM Institute of Technology, Bangalore
11.	Prof. G. Ravindra	Former Director, NCERT, India.
12.	Dr. B. Sooryanarayana	Department of Mathematics, Dr. Ambedkar

		Institute of Technology, Bangalore.
13.	Dr. R. Chandrasekhar	Department of MCA, PESIT, Bangalore.
14.	Dr. Deepa Sinha	Department of Mathematics, South Asian University, Akbar Bhawan, Chanakyapuri, New Delhi.

- The following experts delivered talks on Emerging trends in Graph Theory during IV National Conference held on February 15-16, 2013.

Sl. No	Name	Address
15.	Prof. S. A. Chowdum	Professor Emiritus, IIT Madras
16.	Dr. I. Sahul Hamid	Depratment of Mathematics, The Madura College, Madurai-11.
17.	Dr. Davis M. A.	Faculty of Engineering, Christ University, Bangalore.
18.	Dr. L. Sunil Chandran	Computer Science and Automation, IISc
19.	Dr. H. P. Patil	Department of Mathematics, Pondicherry University

- Two day PG special workshop on "Current topics in Mathematics" in association with Karnataka Science and Technology Academy organized on March 1-2, 3013. The following personalities were the resource persons.

Sl. No	Name	Address
1.	Dr. H. S. Nagaraj	Member KSTA, Director of BASE
2.	Prof. Vittal Rao	Centre for Electronics Design and Technology, Indian Institute of Science, Bangalore.
3.	Prof. A . K. Nandakumar	Department of Mathematics Indian Institute of Science, Bangalore.
4.	Dr. R Rangarajan	Department of Mathematics Mysore University
5.	Prof. G Ravindran	Former Director NCERT
6.	Prof. G D Veerappa Gowda	Centre for Applicable Mathematics TIFR, Bangalore
7.	Dr. K. V. Nagaraj	Department of Mathematics Amrita School of Engineering, Bangalore.
8.	Dr. Hamsapriye	Department of Mathematics R V College of Engineering, Bangalore.

Experts of BOS

- Dr. P. M. Balagondar, Professor and Chairman, Department of Mathematics, Bangalore University.
- Dr. Kaushal Verma, Professor, Department of Mathematics, IISc, Bangalore

- Dr. Hemalatha, Professor and Head, Department of Mathematics ,Mount Carmel College, Bangalore.

List of students who completed MPhil programme

- **Fluid Mechanics**

Sl. No	Name of the student	Name of the guide	Title of dissertation	Year of completion
1.	Arun Kumar N	Dr. S. Pranesh	Double Diffusive convection in micropolar fluid.	2009
2.	Aswathy Mary Joseph	Dr. S. Maruthamanikandan	Rayleigh-Benard-Marangoni ferroconvection in a porous medium	2009
3.	Hiran Kalita	Dr. S. Maruthamanikandan	Chemically driven Rayleigh-Benard-Marangoni convection in a porous medium	2009
4.	Kiran R. V	Dr. S. Pranesh	Rayleigh-Benard Marangoni magnetoconvection in a micropolar fulid with Maxwell-Cattaneo law.	2009
5.	Nisha Mary Thomas	Dr. S. Maruthamanikandan	Thermocapillary ferroconvection in a sparsely distributed porous medium	2009
6.	Prasad N.S.	Dr. S. Maruthamanikandan	Chemical reaction induced Marangoni convection in a sparsely distributed porous medium	2009
7.	Sangeetha George K	Dr. S. Pranesh	Effect of magnetic field on the onset of Rayleigh-Benard convection in Bossinesq Stokes suspensions with time periodic boundary temperatre.	2009
8.	Smita S. N	Dr. S Pranesh	Effect of Rayleigh-Benard convection in a second order fluid with Maxwell- Cattaneo law and general boundary conditions.	2009
9.	Anu V Zacharias	Dr. S. Pranesh	Effect of magnetic field and non-uniform temperature gradient on the onset of Rayleigh-Benard convection in Boussinesq- Stokes suspensions.	2010
10	Therese Rebello	Dr. S. Pranesh	The effect of second sound on	2010

			the onset of Rayleigh- Benard convection in viscoelastic Oldroyd fluid with general boundary conditions.	
11	Sanjok Lama	Dr. S. Pranesh	Effect of magnetic field on the onset of Rayleigh-Benard convection in a micropolar fluid with internal heat generation.	2010
12	Sowmya R	Dr. S. Pranesh	Study of effect of non-linear temperature profile and coriolis force on the onset of Rayleigh-Benard Marangoni magnetoconvection.	2010
13	Radha B.N	Dr. S. Pranesh	Effect of internal heat generation on the onset of Rayleigh-Benard Marangoni magnetoconvection in a horizontal layer of fluid with suspended particles.	2010
14	Mala K. K	Dr. Shivasharanappa Sigarkanti	Effect of second sound on the onset of Rayleigh-Benard Marangoni magnetoconvection	2010
15	Riya Baby	Dr. S. Pranesh	Rayleigh-Benard Marangoni electroconvection in a dielectric micropolar fluid.	2010
16	Ritu Guray	Dr. S. Pranesh	Effect of coriolis force and non-uniform basic temperature gradient on the onset of Rayleigh-Benard Marangoni convection with Maxwell Cattaneo law.	2010
17	Rashmi Venkatesh Murthy	Dr. S. Maruthamanikandan	Effect of temperature modulation on Rayleigh-Benard convection in a rotating layer of a ferromagnetic fluid	2010
18	Ningthoujam Shibiraj Singh	Dr. S. Maruthamanikandan	Influence of radiative transfer on Rayleigh-Benard-Marangoni convection in a couple-stress fluid saturated porous medium	2010
19	U. Aparna	Dr. S. Maruthamanikandan	Chemical reaction induced convection in a densely packed porous medium saturated with a couple-stress fluid	2010
20	V. Chitra	Dr. S.	Effect of radiative transfer on	2010

		Maruthamanikandan	the onset of Rayleigh-Benard convection in a couple-stress fluid	
21	B.N. Deepika	Dr. S. Maruthamanikandan	Chemically driven Rayleigh-Benard convection in a sparsely distributed porous medium saturated with a couple-stress fluid	2010
22	Syeda Khudeja Akbar	Dr. S. Maruthamanikandan	Rayleigh-Bènard-Marangoni Convection in a Horizontal Porous Layer Saturated with a Chemically Reacting Couple-Stress Fluid	2011
23	Fathimunnisa	Dr. S. Maruthamanikandan	Convective Instability in a Horizontal Porous Layer Saturated with a Radiating Couple-Stress Fluid	2011
24	Shinitha Jose	Dr. S. Pranesh	Effect of suction-injection-combination (SIC) on the onset of magnetoconvection in a fluid with suspended particles under 1g and μ g with free-slip bottom.	2012
25	Swetha Basappa Y	Dr. S. Pranesh	Effect of magnetic field and non-uniform temperature gradient on the onset of Rayleigh-Benard- Marangoni convection with free-slip bottom in a micropolar fluid.	2012
26	K. Rekha	Dr. S. Pranesh	Effect of coriolis force and non-uniform basic temperatre gradient on the onset of Rayleigh-Benard convection in second order fluid with general boundary conditions.	2012
27	Anjana K	Dr. S. Pranesh	Effect of coriolis force and gravity modulation on the onset of Rayleigh-Benard- convection in weak electrically conducting Bissinesq- Stokes suspensions.	
28	Sameena Tarannum	Dr. S. Pranesh	Effect of gravity modulation on the onset of Rayleigh-Benard- convection in weak electrically conducting couple stress fluid with saturated porous layer.	2012
29	Jincy C. P.	Dr. S. Pranesh	Effect of non-uniform basic	2012

			temperature gradient on the onset of Rayleigh-Benard-convection in Maxwell's Viscoelastic fluid with Maxwell-Cattaneo law.	
30	Maria Anncy S	Dr. S. Pranesh	Rayleigh-Benard- convection in micropolar fluid saturated porous media with Maxwell-Cattaneo law.	2012

- **Graph Theory**

Sl. No	Name of the student	Name of the guide	Title of dissertation	Year of completion
1.	Shunmugasundari	Dr. Shivasharanappa Sigarkanti	Changing and unchanging domination parameters.	
2.	N. Levi Chellson	Dr. Shivasharanappa Sigarkanti	Inverse domination number of graphs.	
3.	Jose Christopher	Dr. Shivasharanappa Sigarkanti	Coloring of graphs	
4.	Jijo Thomas	Dr. Fr. Joseph Varghese	On degree sequence of total graphs and the order of the graphs	
5.	James Alex	Dr. Fr. Joseph Varghese	On specific properties common to a graph and its complement	
6.	Raja Rajeswari	Dr. Fr. Joseph Varghese	Study of acyclic chromatic index of graphs and related properties.	

- **Riemannian Geometry**

Sl. No	Name of the student	Name of the guide	Title of dissertation	Year of completion
1.	Anerban Roy	Prof. Hari Baskar	On some study of surfaces and curves in Minkowski-3 space.	2009
2.	Jaya Roy	Prof. Hari Baskar	On the study of some ruled surfaces in Minkowski-3 space.	2009

Faculty with PhD

Sl. No	Name of the faculty and qualifications	Name of the guide	Title of thesis	Name of the University and Year
1.	Dr. S Pranesh M.Sc., Ph.D.	Dr. Pradeep G Siddheshwar	Rayleigh-Benard and Marangoni convection in non-Newtonian fluids.	Bangalore University (2001)
2.	Dr. Fr. Abraham V. M. M.Sc. Maths, M.S in Computer Science (USA) ,Ph.D	Dr. Y. B. Maralabhavi	Study in graph theory-path covering parameters in graphs	Bangalore University (2009)
3.	Dr. Fr. Joseph Varghese M.Sc., DNCT, MPhil, Ph.D	Dr. A. Antonysamy	Observations in continuous monotonic decomposition of connected graphs-special cases in complete tripartite graphs and other related topics	Manonmaniam Sundaranar University (2010)
4.	Dr. Mayamma Joseph M.Sc., M.Phil., PGDHE,MBA,Ph.D	Dr. I Sahul Hamid	A study on induced path decomposition of graphs.	Christ University (2012)
5.	Dr. Hari Baskar M.Sc., B.Ed., M.Phil, Ph.D	Dr. Y. B. Maralabhavi	On some properties of hypersurfaces of different types of manifolds	Bangalore University (2012)
6.	Dr. Sangeetha George K M.Sc., M.Phil, Ph.D	Dr. S Pranesh	Study of effect of modulations on the onset of Rayleigh-Benard convection in Couple Stress Fluid	Christ University (2013)

Faculty pursuing PhD

Sl. No	Name of the faculty	Name of the guide	Name of University
1	Prof. T V Joseph M.Sc., M. Phil.	Dr. S. Manjunath, Professor and Head, Department of Mathematics, BNMIT, Bangalore	Christ University
2	Prof. Gangadhar S K M.Sc, M.Phil	Dr. S. Maruthamanikandan	CMJ University

3	Ms. Smita S N M.Sc., M.Ed., M.Phil	Dr. S. Maruthamanikandan	Christ University

No: of publications in National/ International Journals of repute: 40

Details of publication in 2012-2013

- Smita S N and S Pranesh-2012, Rayleigh-Benard convection in a second-order fluid with Maxwell-Cattaneo law, Bulletin of Society for mathematical services and standards (BSO MA S S), Vol.1, No.2, pp.33-48.
- Joseph Varghese and A. Antonysamy-2012, Some basic bounds of graphs accepting continuous monotonic decomposition, International Journal of Mathematical Sciences and Engineering Applications, Vol.6, No.III, pp: 351-363.
- Joseph Varghese -2012,On Some Complete Tripartite Graphs that do not accept Continuous Monotonic Decomposition, *Asian Journal of Science and Applied Technology* (ISSN 2249-0698)
- S. Pranesh and Arun Kumar N- 2012, Effect of non – uniform basic concentration gradient on the onset of Double – Diffusive Convection in Micropolar Fluid, Applied Mathematics, Vol. 3, No. 5, pp 417-424.
- S. Pranesh and Riya Baby- 2012, Effect of non – uniform temperature gradient on the onset of Rayleigh – Benard Electro Convection in a Micropolar Fluid, Applied Mathematics, Vol. 3, No. 5, pp 442-450.
- S. Pranesh and R. V. Kiran-2012, The study of effect of suction – injection – combination on the onset of Rayleigh – Benard – Magnetoconvection in a Micropolar fluid using Maxwell – Cattaneo Law, American journal of Pure and Applied Mathematics, Vol. 2, No. 1, pp 21 – 36.
- S Pranesh and R. V. Kiran-2012, Effect of non-uniform temperature gradient on the onset of Rayleigh-Benard-Magnetoconvection in micropolar fluid with Maxwell-Cattaneo law,Mapana J Sci, Vol.11, No.3, pp:193-214.
- Hari Baskar- 2012, Quasi conformally flat Sasakian Hypersurface of the Generalized Recurrent Kählerian Manifold, J.T.S., Vol. 6, No.1, pp.1-9.
- Mayamma Joseph, I Sahul Hamid and Abraham V. M- 2012, Equiparity induced path decomposition in trees, International Journal of Mathematics and Soft Computing, Vol.2, No1, pp:21-24.
- Jijo Thomas and Joseph Varghese- 2013, On the decomposition of total graphs, AMO-Advanced Modelling and Optimization, Vol.15, No.1,pp.81-84.
- Arumugam S, I Sahul Hamid and Abraham V. M- (Accepted), Decomposition of graphs into paths and cycles, Journal of Discrete Mathematics.

Awards/ honours

- Dr. Fr. Joseph Varghese received best paper award at the two-day National conference on " Frontiers in applied Mathematics" organized by PG Department of Mathematics and RCAM, MES college of Arts, Commerce and Science on 9th and 10th March, 2012.

Student achievement

- **Kshipra Gurunandan** of 2008-2011 batch has the rare distinction of obtaining full international scholarship for two-year course at the *Paris Graduate School of Mathematical Sciences with* specialisation on *Modelling and Decision Mathematics*.
- CNN IBN has recognized **Ms. Aiswarya R. M. (Reg. No: 1215354, 2PCM)** and presented her with **'Citizen Journalist' award in 2013**.
- **Ms. Aiswarya R. M. (Reg. No: 1215354, 2PCM)** has been selected to present project titled " Tipping points, critical transitions and Earth's climate" in Mathematics Planet Earth -MPE 2013 competition.