

DEPARTMENT OF MATHEMATICS
CENTRAL UNIVERSITY OF KERALA
PERIYE, KASARAGOD

Minutes of the Second Board of studies meeting held on Thursday, 7th February, 2019 in the Department of Mathematics in Room No. 28 at 2.30 p.m.

The following members were present:

1. Prof. Gadadhar Misra,
Department of Mathematics,
Indian Institute of Science, Bangalore – 560 012.
2. Prof. A.K. Nandakumaran,
Department of Mathematics,
Indian Institute of Science, Bangalore – 560 012.
3. Prof. A. R. Rajan, Emeritus Professor,
Department of Mathematics, University of Kerala,
Thiruvananthapuram, Kerala – 695 581.
4. Mr. V. Kumar, Assistant Professor,
Department of Computer Science, CU Kerala.
5. Dr. V. Vilfred, Associate Professor & Head,
Department of Mathematics, CU Kerala.
6. Dr. K. A. Germina, Associate Professor,
Department of Mathematics, CU Kerala.
7. Dr. Ali Akbar K, Assistant Professor,
Department of Mathematics, CU Kerala.

The Meeting started at 2.30 p.m. The Chairperson Dr. V. Vilfred welcomed the members and submitted the modified Course Structure and Syllabus approved by the Faculty Council, Department of Mathematics, CU Kerala. Then, he briefed how and what modifications were done in the communicated Course Structure and Syllabus.


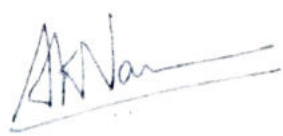

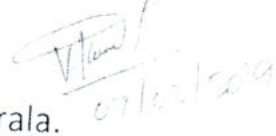
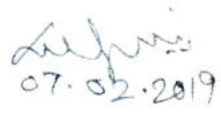
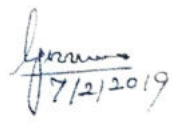
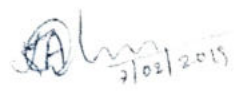
With the permission of the experts in the Board of Studies, the convenor invited Dr. Shaini P, Dr. S. Gnanavel and Dr. Manikandan Rangaswamy to join the BoS Meeting. The committee commended on each and every paper and also on the course structure. The whole structure and Syllabus was thoroughly discussed. The revised version of the same was prepared and submitted for the approval. The Members of the Board of Studies approved the revised Course Structure and Syllabus. (A copy of the approved Course structure and Syllabus is attached herewith.) The committee decided to implement the revised course structure and syllabus from the academic year 2019 - 20 onwards.

The members also commented on the Method of Evaluation of M.Sc. Mathematics Programme and requested to include the same in the minutes. The experts strongly recommended that the mode of evaluation of examinations should be strictly internal.

The members of the BoS seriously noted the current strength of intake at CU Kerala to M.Sc. Maths programme that is increased to forty seats and strongly recommend that for quality teaching the number of teaching faculty in the Department of Mathematics should be increased sufficiently since present strength of seven faculty is quiet insufficient.

The meeting was fruitful and Dr. K.A. Germina thanked the experts for their valuable suggestions and guidance.

The meeting came to a close at 5.00 p.m.

1. Prof. Gadadhar Misra,
Department of Mathematics,
I.I.Sc., Bangalore – 560 012. 
2. Prof. A.K. Nandakumaran,
Department of Mathematics,
I.I.Sc., Bangalore – 560 012. 
3. Prof. A. R. Rajan, Emeritus Professor,
Department of Mathematics,
University of Kerala, Trivandrum, Kerala – 695 581. 
4. Mr. V. Kumar, Assistant Professor,
Department of Computer Science, CU Kerala. 
5. Dr. V. Vilfred, Associate Professor & Head,
Department of Mathematics, CU Kerala. 
6. Dr. K. A. Germina, Associate Professor,
Department of Mathematics, CU Kerala. 
7. Dr. Ali Akbar K, Assistant Professor,
Department of Mathematics, CU Kerala. 

Syllabus:

Introduction: rationality, intelligence, common knowledge, von Neumann-Morgenstern utilities;

Noncooperative Game Theory: strategic form games, dominant strategy equilibria, pure strategy Nash equilibrium, mixed strategy Nash equilibrium, existence of Nash equilibrium, computation of Nash equilibrium, matrix games, minimax theorem, extensive form games, subgame perfect equilibrium, games with incomplete information, Bayesian games.

Mechanism Design: Social choice functions and properties, incentive compatibility, revelation theorem, Gibbard-Satterthwaite Theorem, Arrow's impossibility theorem, Vickrey-Clarke Groves mechanisms, DAGVA mechanisms, Revenue equivalence theorem, optimal auctions.

Cooperative Game Theory: Correlated equilibrium, two person bargaining problem, coalitional games, the core, the shapley value, other solution concepts in cooperative game theory.

Text books:

1. Y. Narahari, Game Theory and Mechanism Design, IISc Press and the World Scientific, 2014.

References:

1. Roger B. Myerson, Game Theory: Analysis of Conflict, Harvard University Press, September 1997.

2. Martin J. Osborne, An Introduction to Game Theory, Oxford University Press, 2003.

Code:MAT5013: Mathematical Finance Prerequisites: Probability theory and Differential Equations.	L	T	P	Credit
	3	2	0	4

Course Category	Elective
Course Type	Theory
Course Objective	The primary goal of this course is to teach students some necessary mathematical techniques and how to apply them to the fundamental concepts and problems in financial mathematics and their solution.
Course Outcome(s)	The main contents include: Introduction to probability theory, random variable, probability density, mean, and variance of a random variable. The applications include interest rate, coupon bonds, arbitrage, Brownian

	<p>motion, geometric Brownian motion for mathematical models on stock price, etc.</p>
<p>Syllabus: Introduction to investment securities and financial derivatives, Random walk, Brownian Motion, Geometric Brownian Motion, Interest rates and Present Value Analysis, Pricing Contracts via Arbitrage, Arbitrage Theorem, Black-Scholes Formula, Valuing by expected utility, Exotic Options, Models for Crude Oil data, Autoregressive Models and Mean reversion.</p> <p>Text books: 1. S. M. Ross, An Elementary Introduction to Mathematical Finance, 3rd Edition, Cambridge University Press, 2011.</p> <p>References: 1. John Hull, Options, Futures, and Other Derivatives, 8th Edition, Prentice Hall, 2011. 2. M. Baxter and A. Rennie, Financial Calculus: An Introduction to Derivative Pricing, Cambridge University Press, 1996. 3. Darrell Duffie, Dynamic Asset Pricing Theory, 3rd Edition, Princeton University Press, 2001. 4. Paul Wilmott, Sam Howison and Jeff Dewynne, The Mathematics of Financial Derivatives: A Student Introduction, Cambridge University Press, 1995. 5. J. P. Fouque, G. Papanicolaou and K. R. Sircar, Derivatives in Financial Markets with Stochastic Volatility, Cambridge University Press, 2000.</p>	

Code:MAT5014: Mathematical Methods Prerequisites:	L	T	P	Credit
	3	2	0	4

Course Category	Elective
Course Type	Theory
Course Objective	The main aim is to make students familiar with Laplace, Fourier transformations, extrema of functional through calculus of variations and integral equations.