# DEPARTMENT OF MATHEMATICS

## CENTRAL UNIVERSWITY OF KEREALA

## 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 fourty 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. 07.02.2019

6. Dr. K. A. Germina, Associate Professor,
   Department of Mathematics, CU Kerala. 7/2/2019

7. Dr. Ali Akbar K, Assistant Professor,
   Department of Mathematics, CU Kerala. 7/02/2019

2009. 4. D.M. Burton, A First Course in rings and ideals, Addison-Wesley, 1970.
5. C. Musili, Introduction to Rings and Modules, Narosa Publishing House, 2001.

| **Code:MAT5202: Complex Analysis**<br>Prerequisites: fundamental Ideas and theorems about Complex plane power series residues | L | T | P | Credit |
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| Course Category | Core |
| Course Type | Theory |
| Course Objective | The objective of this course is to introduce the fundamental ideas of the functions of complex variables and developing a clear understanding of the fundamental concepts of Complex Analysis such as analytic functions, complex integrals and a range of skills which will allow students to work effectively with the concepts. |

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| Course Outcome(s) | Represent complex numbers algebraically and geometrically, Define and analyze limits and continuity for complex functions as well as consequences of continuity, Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on Harmonic and entire functions including the fundamental theorem of algebra. Analyze sequences and series of analytic functions and types of convergence, Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral. Theorem in its various versions, and the Cauchy integral formula, and Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and Evaluate complex integrals using the residue theorem. |

**Syllabus:**

Conformal mapping, Linear transformations, cross ratio, symmetry, oriented circles, families of circles, use of level curves, elementary mappings and Riemann surfaces.

Complex integration, rectifiable curves, Cauchy's integral theorems for rectangle and disc, Cauchy's integral formula, higher derivatives. Local properties of analytic functions, removable singularities, Taylors theorem, Taylor series and Laurent series, zeroes and poles, local mapping, the maximum principle. Chains and cycles, simple connectivity, locally exact differentials, multiply connected regions, residue theorem, argument principle, evaluation of definite integrals

Harmonic functions, mean value property, Poissons formula, Schwarz theorem, reflection principle, Weierstrass theorem.

**Text books:**

1. L.V. Ahlfors, Complex Analysis, Third Edition Mc-Graw Hill International, 1979. 2. H. A. Priestley, Introduction to Complex Analysis, Oxford University Press, 2003.

**References:**

1. John M. Howie, Complex Analysis, Springer Science & Business Media, 2003. 2. John B. Conway, Functions of One Complex Variable I, Springer Science & Business Media, 1978.

3. J. Brown and R. Churchill, Complex Variables and Applications, McGraw-Hill Education, 2013.
4. V. Karunakaran, Complex Analysis, CRC Press, 2005.
5. Dennis G. Zill, Patrick Shanahan, Patrick D. Shanahan, A First Course in Complex Analysis with Applications, Jones & Bartlett Learning, 2006.

| **Code:MAT5203: Measure and Integration** | L | T | P | Credit |
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