DEPARTMENT OF PHYSICS
SCHOOL OF MATHEMATICAL AND PHYSICAL SCIENCES
CENTRAL UNIVERSITY OF KERALA
(Established under the Central Universities Act 2009)
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Minutes of the Meeting: PG Board of Studies

29.07.2016

Members Present:

1. Professor K J Thomas (Chairman)
2. Professor P. Kolandaivel, Bharathiar University
3. Dr. Alok Sharan, Pondicherry University
4. Dr. Vincent Mathews
5. Vijay Shenoy, IISc, Bangalore (on Skype)

The meeting began at 11.00 AM on 29.07.2016 in the office of the Dean, SPS. The members of the board have discussed and deliberated on the content of the Programme Structure. After the deliberations, the Board of Studies has suggested some modifications to the existing syllabus. The modified programme structure is approved and enclosed herewith.

The programme structure with the modified syllabus will be in force for students admitted in 2016-17 academic year onwards.

Professor P. Kolandaivel

Dr. Alok Sharan

Dr. Vincent Mathew

Professor K J Thomas

PHY5037 Quantum Transport in Low Dimensional Systems

Course Code	PHY5037	Semester	
Course Title	*Quantum Transport in Low Dimensional Systems*		
Credits	3	Type	Elective

Course Structure

Boltzmann transport equation. Transport in large and small systems. Electrochemical potential, Fermi energy and band bending. Two dimensional electron gas, heterostructures and MOSFET. Ballistic transport. 1D transport, cyclotron motion and focussing. Two dimensional systems in magnetic field: Landau levels and quantum Hall effects. Quantum dots and antidots: Coulomb blockade, quantum capacitance, Aharanov - Bohm effect. Effect of Coulomb interactions in 2D and 1D systems: fractional quantum Hall effect, Luttinger liquid and Wigner crystallization.

Suggested Books

1. John H. Davis, Physics of low dimensional semiconductors, An Introduction, Cambridge (1997)
2. M.J.Kelly, Low Dimensional Semiconductors, Clarendon Press (1995)