DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 651: CLASSICAL MECHANICS - I

Course contents:

Calculus of variations. Derivation of Euler's equations and their solutions in special cases. Generalized coordinates. Lagrange's and applications. Kinematics of a rigid body. Rigid body equations of motion. Euler's equations. Motion of a heavy symmetrical top. Relativistic mechanics.

Books Recommended:

1. Sheck, F., Mechanics, Springer Verlay, Berlin, 1988.
2. Goldstein, H., Classical mechanics, Addision Wesley, 1962.
3. Meirovitch, L., Methods of Analytical Dynamics, McGraw Hill 1970.
4. Marion, J. B., Classical Dynamics of Particles and Systems, Second Edition, Academic Press, 1970.
5. Corben, H. C. and Stehle, P., Classical Dynamics, Second Edition, John Wiley, 1960.
6. Rund, H., The Hamilton Jacobi Theory in the Calculus of Variations, D. Van Nostrand, 1966.
7. Caratheodory, C., Calculus of Variations and Partial Differential/Equations of First Order, Part I, Holden Day, 1965.
8. Taylor, E. F. and Wheller, J. A., Spacetime Physics, W.H. Freeman, 1966.
9. Meirovitch L., Methods of Analytical Dynamics, First edition, McGraw Hill, New York, 2007