Programme: M. Sc. (Marine Sciences)
Course Code: MSC 465 Title of the Course: Dynamic Oceanography – I
Number of Credits: 02
Effective from AY: June2018-19

Prerequisites for the course:	Physical Oceanography, Geophysical Fluid Dynamics and Ocean Atmosphere Coupling and Climate courses.	
Objective:	To understand the laws that govern ocean motion and formulate the laws that describes this motion.	
Content:	Basic physical laws used in oceanography – Classification of forces and motion – Equation of continuity – static stability – double diffusion – Equation for the mean or average motion – Non-linear terms in the equation of motion – Eddy viscosity. Currents without friction – Vorticity: relative vorticity, planetary vorticity, absolute vorticity, potential vorticity – Geostrophic flow – Hydrostatic equilibrium – Geopotential – Geopotential surfaces and isobaric surfaces – Geostrophic methods for calculating relative velocity – Thermal wind equation – Relation between isobaric and isopycnal surfaces.	12 hours 12 hours
Pedagogy:	Lectures/Tutorials/ assignments	

References/ Readings	1. Introductory Dynamical Oceanography, 1983 – Pond, S and Pickard, G.H., Pergamon Press, U.K. 2. Principles of Physical Oceanography, 1966 – Newman, G. and Pierson, W.J., PrenticeHall, Inc., New Jersey, U.S.A. 3. Physical Oceanography (Vol.1) 1961 – Defant, A., Oxford pergamon press, U.K. 4. The dynamics of the upper ocean (2nd edition) 1977 – Phillips, O.M., Cambridge Univ. Press, U.K. 5. Modeling and prediction of the upper layers of the ocean, 1977 – Krous, E.B. (Ed.). 6. Modeling of marine systems, 1986 – Nihoul, J.C.J., Elsevier Scientific Publ. Co., Oxford, U.K. 7. Atmosphere – ocean Dynamics, 1982 - Gill, Adrian E, International Geophysics, 30 Academic press, New York.	
Learning Outcomes	Formulate equations that describe the ocean motion, explain the motion resulting at molecular level,explain types of vorticity and its role in ocean circulation.	