Syllabus for MARS 8110

Course ID:
Title: Marine Sediment Diagenesis
Description: fluxes, biochemical reactions, physical mixing and biological transport processes, cycles of carbon, nutrients, and metals

COURSE OBJECTIVES OR EXPECTED LEARING OUTCOMES

Students will learn nature and properties of marine sediments, including dissolved porewater and solid particle. Students will understand basic diagenetic processes – degradation of organic matter, nutrient cycling, and metal redox chemistry. Theoretical modeling and experimental techniques will be acquired through lectures, paper discussion, and homeworks. Students will be evaluated on their knowledge on solving specific problems of sedimentary diagenetic processes.

TOPICAL OUTLINE

Lectures will cover the following topics: general diagenesis equations, advection, molecular diffusion, bioturbation, flux, classes/kinetics of reactions, microbial degradation, oxidation sequence, porewater geochemistry, reaction-transport model, and a series of case studies in deep ocean, continental margin, and coastal sediments. Emphasis will be given to describe vertical distributions (profiles) of various chemical concentration and physical properties. Factors controlling diagenetic processes will be intensively discussed.

UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

Students will be expected to accomplish all class assignments (paper reading, homework, and presentation) independently. Two exams will be given to test students' ability for applying basic knowledge in sedimentary processes.