

1. Course Number and Title  
ORE 664 Nearshore Processes and Sediment Transport
2. Credits and Contact Hours  
Course is 3 credits. Two 1.25-hour sessions per week
3. Course Coordinator's Name  
Zhenhua Huang
4. Textbook and/or Other Reading Material
  - a. Textbook:  
Coastal Processes with Engineering Applications, Robert G. Dean and Robert A. Dalrymple, Cambridge University Press, 2004
  - b. Reference:
    - i. Coastal Bottom Boundary Layers and Sediment Transport, Advanced Series on Ocean Engineering, Vol. 4, P. Nielsen, World Scientific, 1992
    - ii. Coastal Engineering Manual, Army Corps of Engineers, 2002
    - iii. Supplemental handouts
5. Specific Course Information
  - a. Review of nearshore hydrodynamics. Sediment transport by waves and currents in coastal areas and its effect on morphological processes. Effect of man-made structures on littoral drift and shoreline
  - b. Prerequisites: ORE 607 or consent
  - c. Designation: Coastal Engineering Option
6. Specific Goals for the Course
  - a. The aim of the course is to provide engineers working in the coastal environment with the understanding of nearshore wave, current and sediment processes and their effects on the morphology of beaches and coastlines. The dynamics of the nearshore environment will be explored in detail, including nearshore waves and currents, consideration of wave boundary layer processes and sediment particle dynamics. The course also explores how these processes can be considered using engineering models
  - b. Student Outcomes: (1) Fundamentals. (4) Problem Formulation. (5). Multi-fact design. (6) Communication. (9) Research and Experimentation. (10) Constant Learning.
7. Topic Covered
  - a. Review of fluid dynamics and wave theories
  - b. Nearshore hydrodynamics
  - c. Modeling nearshore waves and currents
  - d. Boundary layer dynamics
  - e. Sediment dynamics and sediment transport
  - f. Cross-shore and longshore sediment transport
  - g. Nearshore morphodynamics
  - h. Introduction to XBeach/Delft3D