1. Course number and Title
   ORE 783 (Alpha) Capstone Design Project

2. Credits and contact hours
   3 credits. The course is conducted as a series of meetings and informal presentations and culminates in a major presentation analogous to a public hearing at a department seminar attended by the faculty, students, and visitors from the local engineering community.

3. Instructor's or course coordinator's name
   Kwok Fai Cheung with David Smith, David Rezachek, and/or Dayan Vithanage

4. Textbooks
   Textbooks: None
   Reference books: Applicable design manuals

5. Specific course information
   a. Course content: Major design experience based on knowledge and skills acquired in earlier coursework incorporating realistic constraints that include economic, environmental, ethical, social, and liability considerations. Emphasis is placed on teamwork and consultant-client relationship. (B) coastal engineering; (C) offshore engineering; (D) ocean resources engineering. Repeatable one time
   b. Prerequisites by Topics:
      i. All students: hydrostatics, at-sea experience, oceanography, water wave mechanics, wave-structure interaction, and engineering economics.
      ii. Coastal engineering students: coastal and harbor structures, coastal processes, and sediment transport.
      iii. Offshore engineering students: structural analysis and dynamics of floating structures.
      iv. Ocean resources engineering students: OTEC system and marine mineral resources.
   c. Designation:
      i. Coastal Engineering Required Course (B)
      ii. Offshore Engineering Required Course (C)
      iii. Ocean Resources Engineering Required Course (D)

6. Specific goals for the course
   a. Learning Outcomes:
      The course familiarizes the students with the planning and design of a real-life engineering project in a consulting firm setting. Emphasis is placed on teamwork, risk management, decision making with insufficient information, consultant-client relation, ethics, and environmental and economic aspects of engineering design. Specific learning outcomes include
      i. Appreciation of professional and ethical responsibilities
      ii. Ability to work independently and function on multi-disciplinary teams
      iii. Ability to design and optimize ocean and resources engineering systems
      iv. Ability to use techniques, tools, and data necessary for ocean engineering practice
      v. Ability to communicate effectively to technical and non-technical audiences
   b. Student Outcomes: (1) Fundamentals. (2) Core program. (3) Option area. (4) Problem formulation. (5) Multi-facet solution. (6) Communication. (7) Ethical & professional responsibility. (8) Teamwork. (9) Research and experimentation. (10) Constant learning.

7. Brief list of topics to be covered

   The topic varies every semester and reflects the latest engineering projects in Hawaii. ORE 783B has been team taught with practicing professional engineers from Oceanit Inc. and Sea Engineering Inc., Hawaii. Healy Tibbitts Builders Inc., a major marine contractor in Hawaii, has been supporting the capstone design class by providing feedback to student designs and up-to-date cost and construction data.