EOC 4193 OCEAN THERMAL SYSTEMS
ABET Course Syllabus

1. **Course number and name:** EOC 4193 Ocean Thermal Systems

2. **Credits and contact hours:** 3 credits / Two 80 minute lectures each week

3. **Instructor's or course coordinator's name:** Dr. M. Dhanak

4. **Text book, title, author, and year:**

   Heat and Mass transfer Fundamental and application, 4th Edition by; Yunus A. Cengel and Afshin J. Ghajar, McGraw-Hill, 2010.

5. **Specific course information:**

   (a) Brief description of the content of the course (catalog description): The course deals with basic concepts of heat and mass transfer concepts with application to the ocean and ocean systems. Applications will include power cycles and heat exchangers in ocean systems. The interactive environmental processes involving solar radiation, convective ocean circulation, evaporation and mixtures will be considered.

   (b) Prerequisites: EGN 3343 Engineering Thermodynamics, MAP 4306 Engineering Math II or EML 4534 Computer Applications in ME 2 (both with a grade of C or above).

   (c) Co-requisites: EOC 3123 Ocean Engineering Fluid Mechanics (with a grade of C or above).

   (d) Indicate whether a required, elective, or selected elective course in the program: Required

6. **Specific goals for the course:**

   (a) Specific outcomes of instruction (course specific objective): The objective of the course is to examine the basic mechanisms of thermal energy exchange as they apply to ocean thermal systems including: life support systems, prime mover power production, environmental control, and energy exchange in the atmosphere and oceans.

   (b) Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. The learning outcomes of the course (and related ABET Criterion 3) outcomes are:

   1. An understanding of the basic physical mechanisms of conduction, convection and radiation heat transfer (a/1)
   2. The ability to solve basic thermal science problems including the selection of insulation and fins in conduction/convection systems and the design of radiation heat shields. (a,e/1)
   3. The ability to select heat exchangers for particular applications including fouling effects (a, c/1,2)
   4. A basic understanding of the behavior of gas mixtures as used in life support systems. (a/1)
   5. The ability to select appropriate prime mover systems for marine systems. (k/1,2,6)

7. **Brief list of topics to be covered:**
   - Conduction heat transfer.
   - Convection heat transfer (forced & natural).

- Radiation.
- Thermodynamic power and refrigeration cycles.
- Thermodynamics of gas mixtures including psychometrics.
- Heat exchangers.