1. Course Number and Title
   ORE 203 Surf Science and Culture

2. Credits and contact hours
   3 credits, two 1.25-hour sessions per week.

3. Instructor's or course coordinator's name
   Justin Stopa

4. Textbooks
   Textbooks: None
   Reference books:
   a. Latest IPCC Report; Currently: IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp, doi:10.1017/CBO9781107415324.
   b. Coastal Engineering Manual – Part II, US Army Corps of Engineers, 2006, PDF version online: http://chl.erdc.usace.army.mil
   c. Waves in Oceanic and Coastal Waters, by LH. Holthuijsen, Cambridge University Press, 2007.
   d. Butts, Tony, 2014. Surf Science: An Introduction to Waves for Surfing, Tony Butts, Honolulu University Press.
   e. Garrison, Tom, An Invitation to Marine Science, (any edition) - 9th edition, 2015, 624 pp.
   f. Holthuijsen, Leo H., 2007. Waves in Oceanic and Coastal Waters, Cambridge University Press.
   g. Open University Course Team, 1999. Waves, Tides and Shallow-Water Processes.

5. Specific course information
   a. Course content: Science of ocean waves and the importance of ocean waves to research pursuits, cultural perspectives in Hawai`i and the Pacific, navigation, and engineering.
   b. Prerequisite: Basic mathematics or consent
   c. Designation: Elective, not specifically part of the ORE Master's program

6. Specific goals for the course
   a. Specific learning outcomes include:
      i. Demonstrate familiarity with the scientific process.
      ii. Demonstrate familiarity with basic oceanography and ocean engineering vocabulary.
      iii. Demonstrate familiarity with the geography of Hawai`i and the Pacific.
      iv. Understand the relationship between Western science and the culture in Hawai`i and the Pacific.
      v. Describe the sea state climate with respect to wind seas versus swells and be able to relate the regional climates to basin-scale circulation.
      vi. Understand wave transformations (refraction, shoaling, breaking, etc.) and their importance in our society and how they are perceived by Indigenous cultures.
      vii. Know several different technologies that measure ocean waves and their limitations.
      viii. Understand the importance of the ocean to our everyday lives as they relate to infrastructure, ocean activities, design, ecosystem, commerce, and cultural significance.
      ix. Understand the various impacts and mitigation strategies for climate change and sea-level rise in the Pacific region.

x. Understand tangible ways to pursue studies or jobs related to ocean science and engineering.

7. Brief list of topics to be covered
   a. Oceanography and engineering - importance of waves to society
   b. Climate - atmospheric and oceanic circulation
   c. Tides
   d. Wind-wave interactions
   e. Wave mechanics
   f. Wave transformations
   g. Wave propagation
   h. Nearshore dynamics
   i. Wave observations
   j. Hydrodynamics
   k. Climate Change