1. Describe prominent challenges to sustainability faced by contemporary societies (e.g., energy, water), and some of the ways sustainability is assessed (e.g., the per capita global hectare).

2. Engage in informed and rigorous discussions about intersections between science and sustainability, including

   - the goals, methods, and scope of scientific endeavor (e.g., philosophical underpinnings, the distinction between disciplinary and interdisciplinary methodologies, distinctions between good science and junk science, the social nature of scientific revolution, and the role of values in science research);

   - the goals and methods, and scope of sustainability (e.g., historical antecedents, modern-day distinctions between sustainable development and environmentalism, and land ethics);

   - conventional and emerging scientific approaches to the challenges of sustainability (e.g., use of thermodynamic laws to predict the efficiency of power plants and the CO_2 output of given fuels, biomimicry, green chemistry, Coasean economics and social networking, and resilience thinking); and

   - the adequacy and shortcomings of existing scientific institutions for promoting sustainability-related objectives (e.g., the disciplinary structure of undergraduate curricula, the larger purpose of education, and criteria used to formulate new research directions).

3. Use quantitative and qualitative tools for describing socio-ecological systems, including

   - inferring exponential and power law parameters (e.g., doubling times and scaling exponents) from numerical data;

   - writing and solving radiative balance equations for planetary models in the presence of greenhouse gases; and

   - identifying positive feedback loops from given data.