Organizations are frequently faced with the problem of how to get entities (which may or may not naturally organize themselves in favorable configurations) to operate together in an effective way to achieve a goal. The term “systems engineering” (SE) is often used to refer to several different concepts, disciplines, and technical skills; engineering is both a set of rules and practices for what we do, and the processes of solving problems. However, confusion arises when proponents of one perspective interact with others, without a clear understanding of the variety of SE histories and tools. Each can play an important, complementary role in the development of a robust approach to SE and the role of the human in systems.

This course provides an introduction to, and references for distinct approaches to systems engineering concepts and tools. Individual assignments and team projects will be based on readings from these multiple approaches and selected case studies. Participants will be encouraged to bring their own prior expertise and examples to the discussions and projects. While the course will discuss quantitative topics (including cybernetics, feedback control systems, and statistical process control), the course itself will emphasize a more interdisciplinary conceptual integration rather than stand-alone analysis of these topics.