GRADUATE CERTIFICATE IN SYSTEMS

Purdue’s Systems Collaboratory initiated the Graduate Certificate in Systems in Fall 2018, a program designed for Purdue graduate students (on-campus and distance) across all majors as well as continuing education professionals.

The Certificate program is a response to the need for a new generation of leaders with a holistic perspective, who can address the most challenging and complex problems of today’s societies. Purdue graduates have continuously made technological breakthroughs, developed innovative products, created timeless designs, and discovered better ways to feed the world. It is time to pioneer the education of scientists, economists, engineers, designers, and humanitarians who are also systems thinkers; future leaders who can see the hidden interconnections between different elements of a system and turn the spotlight on the role of humans. These systems range from large-scale power grids and political/social systems to small-scale devices, such as motors for unclogging blood vessels and 3-D nanostructures.

PLAN OF STUDY

The Certificate in Systems program is administered through the Office of the Provost and is governed by the PSC Educational Committee representing different Purdue colleges. The study plan for the certificate includes three graduate SYS courses (9 credit hours) that introduce fundamental of systems thinking and enable students to gain a systems perspective, teaching tools and methodologies that can be applied in a variety of complex problems, and discuss emerging grand challenges at all levels.

The three SYS courses in the program had been previously offered cross-listed in the different variations between Fall and Spring. If a student has completed any of these courses, the course can be counted towards fulfillment of the certificate requirements.

SYS 50000 - PERSPECTIVES ON SYSTEMS

Engineers are frequently asked to solve problems to operate together effectively to achieve a goal. 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 engineering systems. This course provides an introduction to, and references for, each of 4 distinct approaches to SE concepts/tools.

SYS 51000 - TOOLS AND METHODOLOGIES FOR DESIGNING SYSTEMS

The purpose of the course is to emphasize patterns of systems thinking, to introduce systems engineering processes and methods, and to introduce theory for model-based systems engineering, and provide practice in using a model-based systems engineering tool.

SYS 53000 - PRACTICAL SYSTEMS THINKING

Engineers, social scientists, and managers frequently bring people and technology together to address complex problematic situations in an equitable way that benefits people and the environment. Multiple systems concepts and methods have been developed to address these situations, and typical courses in systems focus on a relatively small portion of the rich assortment of available approaches to addressing systems problems. This course introduces students to multiple systems concepts and methods via readings and class discussion. The students then apply these concepts and methods on team-based projects. The course will emphasize critical thinking about how the concepts and methods are applicable to the problematic situations of the projects and how well the project teams were able to perform the required activities.

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