



Systems Engineering Training

For over a decade, the Idaho National Laboratory (INL) has set the standard as the premier Systems Engineering organization within the U.S. Department of Energy (DOE). As part of its ongoing mission to provide Systems Engineering tools and expertise, the INL Systems Engineering Department has developed a suite of training modules designed to help laboratory, university, and external customers understand and apply Systems Engineering concepts and better manage the complexities associated with their projects. Training modules range from brief tutorials to week-long, university quality courses that can be uniquely tailored to meet the needs of any project.

Introductory Briefing on Systems Engineering

This 2-hour briefing provides a top-level, introductory overview of Systems Engineering and is designed to help attendees:

- Understand why Systems Engineering is becoming an integral part of the way government and industry does business
- Gain a broad awareness of the Systems Engineering process and its associated products.

This briefing does NOT address specific SE tools and applications.

Tutorial – Simple Techniques for Applying Systems Engineering Principles

Originally developed for presentation at the Annual Symposium of the International Council on Systems Engineering, this

tutorial can be tailored to the needs of the audience as a half- or full-day offering and is designed to introduce new-comers and seasoned practitioners alike to the overall Systems Engineering process as it relates to typical project life-cycle phases. The tutorial also presents a few of the “simple” tools (with practical examples) that have been found useful in conducting Systems Engineering work.

Attendees learn how to use items as simple as a white board, engineering paper, and standard desktop software to help a project get from concept to system design without the need for high-end tools and technologies.

In-House Training – Systems Engineering Basics

Idaho National Laboratory



This three-session (4 hours each) in-house training course was developed to help newer and younger INL Systems Engineers gain a better understanding of SE principles, concepts, and tools. The course provides a consistent set of terms and methodology across the INL SE Department as well as practical examples and lessons learned on the application of SE.

Senior INL Systems Engineers share their experiences and knowledge as a basis for teaching and mentoring new and junior Systems Engineers, who then use the Systems Engineering principles they learn as part of a hands-on paper airplane challenge.

Applying Systems Engineering in the DOE Environment

Applying Systems Engineering moves beyond a philosophical discussion of what Systems Engineering is and addresses how Systems Engineering can be applied, particularly in the DOE Environment. The course consists of 11 instructional modules, each addressing a different aspect of the Systems Engineering process, and provides students with the basic concepts and skills necessary for successful Systems Engineering application.

This week-long (40-hour) course was accredited through the *University of Idaho*, Department of Engineering, as part of a Masters of Engineering

program in Systems Engineering. Additionally, the course provided 400-series credit hours towards

Engineering organizations at their respective locations.

In a university setting, the



continuing Professional Engineering development.

In addition to training development and presentation to meet DOE and INL needs, the INL Systems Engineering Department played a significant role in revising the newest release of the *INCOSE Systems Engineering Handbook*, version 3.2.1, and in its being formally accepted by the International Standards Organization (ISO) as a Technical Report for the implementation of ISO Systems Engineering standards. Members of the INL Systems Engineering Department have been invited to adapt instructional materials and develop Systems Engineering guidance to help other DOE organizations establish Systems Engineering principles and practices and stand-up Systems

INL Systems Engineering Department has influenced the accredited engineering curricula at two local universities to include Systems Engineering techniques early in the academic program. These programs then require that these techniques – including problem definition requirements derivation, goals and criteria development, alternatives analysis, and decision making – be applied and presented in Senior Capstone projects.

Any and all of the preceding training offerings can be tailored to meet the needs of any project or organization, including adaptation and infusion into existing university courses of study.

For more information, contact any member of the INL Systems Engineering administrative staff, or visit

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