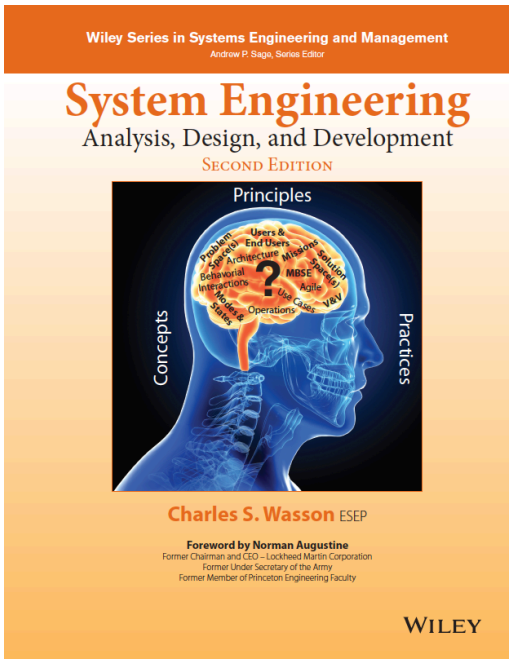
New
2nd Edition

# System Engineering

## Analysis, Design, and Development

### Concepts, Principles, and Practices

On behalf of Wasson Strategics, LLC and John Wiley (New York), I am pleased to announce that the 2nd Edition of *Systems Engineering Analysis, Design, and Development: Concepts, Principles, and Practices* is now available. This 2nd edition is a landmark text in SE that challenges many of today's outdated SE paradigms and provides corrective action solutions. Whereas texts labeled as "Systems Engineering" inappropriately focus on high level system acquisition and management or specialty engineering equations, this 2nd Edition illustrates how to identify and translate Stakeholder operational needs into the physical realization of an Enterprise System or Engineered System - system, product, or service. Unlike other texts that claim to identify SE principles, this text explicitly identifies over 365 SE principles. Key features include:




## Multi-Discipline Audiences

The 2nd Edition is written for upper undergraduate and graduate level instruction, new and seasoned engineers, system analysts, and SE professionals; functional and project managers; and executives.

Written for multi-discipline System Engineering professionals, this text provides a strong foundation in SE *problem-solving and solution-development* concepts, principles, and practices to strengthen Enterprise SE capabilities and apply them to System Engineering & Development (SE&D) projects and team-based environments.

## Foreword

Dr. Norman Augustine, former member of the Princeton Engineering faculty, former Under Secretary of the Army, and former CEO and Chairman of the Board for Lockheed Martin Corporation wrote the Foreword for the 2nd Edition. As an internationally recognized educator and business leader, Dr. Augustine has championed the need to attract students to enter the Engineering field and strengthen Engineering education.

## Table of Contents

The Table of Contents is viewable at John Wiley's website for the text:

http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118442261.html

## Content and Presentation

Unlike any other SE text published to date, the 2nd Edition is based on key learning principles and discussions that incrementally provide insights concerning how SE *problem-solving and solution development* are performed. Each chapter consists of an Introduction, Definitions of Key Terms, Principle-Based Discussions, Summary, and Chapter Knowledge Exercises.

Color printing enhances the learning experience and includes icon-based breakouts from the text to highlight **Principles, Examples, Author's Notes, Mini-Case Studies, Words of Caution, and Warnings**.

## Shifting Outdated SE and Engineering Paradigms

Many of today's SE and Engineering paradigms are simply outdated. The 2nd Edition identifies these paradigms that contribute to project organizational performance issues and system, product, or service failures. Key themes throughout the text focus on "Engineering the System" based on its User's mental models of the system's intended operations and behavior. This is in sharp contrast to traditional Engineering's focus on "Engineering the Box," which *ignores* the User's mental models and produces system designs based on the Engineering Designer's mental models. When these systems fail, human error is often identified as the cause, not poor system design.

## Leading Edge Chapters and Topics

The 2nd Edition addresses leading edge concepts in Commercial and Contract System Development for application across all business domains such as Medical Devices and Healthcare, Aerospace & Defense, Energy, Transportation, Telecommunications, IT, Financial, and many others. Example topics include:

- Deficiencies in Engineering Education
- Agile Development
- Model-Based SE (MBSE) & SysML
- Lean Systems Engineering (Lean SE)
- System Concepts Formulation & Development
- System Phases, Modes, & States of Operation
- Multi-Level System Architecture Development
- System Interface Definition, Analysis, and Control
- Engineering Coordinate Systems and Conventions
- Stakeholder Needs Identification
- User Stories, Use Cases, and Scenarios
- User-Centric System Design (UCSD)
- System Specification Development
- Analysis of Alternatives (AoA)
- System Reliability, Maintainability, & Availability
- System Integration, Test, & Evaluation
- Multi-Level System Verification & Validation (V&V)
- System Deployment; Operations, Maintenance, & Sustainment (OM&S); Retirement, and Disposal

## Instructional Features

The 2nd Edition is printed in FULL COLOR and features:

- ~365 Principles – Explicitly identified
- ~231 SE Examples
- ~288 Figures
- ~21 Mini-Case Studies
- ~60 Tables
- ~148 Author's Notes
- ~348 Bibliographic References

## End-of-Chapter Exercises

The 2nd Edition includes two levels of End-of-Chapter Exercises:

1. Level 1 (Undergraduate) - Chapter Knowledge Exercises (Textbook)
2. Level 2 (Graduate) - Chapter Knowledge Application to Real-World SE Problems (Companion Site)

## Appendices

- Mapping of INCOSE SE Handbook SEHv4.0 to Textbook Chapters
- Systems Modeling Language (SysML™) Constructs

## Companion Website

The 2nd Edition includes a Companion Website to the text's Wiley webpage that includes the following:

- Level 2 - Chapter Knowledge Application to Real-World SE Problems
- Instructor's Reference Guide and Bibliography
- Case Study Links to over 300 news articles, professional papers, and trade publications of news-worthy events that relate to concepts, principles, and practices discussed in Chapters 1 – 34.
- Visit http://bcs.wiley.com/he-bcs/Books?action=index&itemId=1118442261&bcsId=9976