

# Systems Engineering Fundamentals; Course Material

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## Abstract

Listing the course material for the course Systems Engineering Fundamentals.

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# Introduction

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*core*

Systems Engineering Fundamentals Introduction

<http://gaudisite.nl/info/SEFintroduction.info.html>

*optional*

# Course Overview

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Systems Engineering Fundamentals Course Overview

<http://gaudisite.nl/info/SEFoverview.info.html>

*optional*

# Assignments

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Systems Engineering Fundamentals Assignments

<http://gaudisite.nl/info/SEFassignments.info.html>

*optional*

# Programs, Projects, Process, Organization

## *core*

Project Systems Engineering Introduction; Phasing, Process, Organization

<http://gaudisite.nl/info/ProjectSEintroPPO.info.html>

Module System Architecture Context

<https://gaudisite.nl/ModuleSystemArchitectureContextPaper.pdf>

Products, Projects, and Services; similarities and differences in architecting

<https://gaudisite.nl/ProductsProjectsServicesPaper.pdf>

## *optional*

System Engineering Management Plan (SEMP) DOES ONE SIZE FIT ALL?

Zonnenshain, A., Malotaux, N., Honour, E., Kasser, J., Urio, U., Shabtay, M.,  
INCOSE 2009

Systems Engineering Management Plan (SEMP) Technical Content

<https://www.nasa.gov/consortium/SystemsEngineeringManagementPlanTechnicalContent>

*core*

Systems Engineering Fundamentals Life Cycle

<http://gaudisite.nl/info/SEFlifeCycle.info.html>

Modeling and Analysis: Life Cycle Models

<https://gaudisite.nl/MAlifeCyclePaper.pdf>

*optional*

SEBoK Life Cycle models

[https://www.sebokwiki.org/wiki/Life\\_Cycle\\_Models](https://www.sebokwiki.org/wiki/Life_Cycle_Models)

# Needs and Requirements

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Systems Engineering Fundamentals Needs Elicitation

<http://gaudisite.nl/info/SEFneeds.info.html>

*optional*

SEBoK Stakeholder Needs and Requirements

[https://www.sebokwiki.org/wiki/Stakeholder\\_Needs\\_and\\_Requirements](https://www.sebokwiki.org/wiki/Stakeholder_Needs_and_Requirements)

# Requirements Management

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Systems Engineering Fundamentals Requirements Management

<http://gaudisite.nl/info/SEFrequirements.info.html>

Fundamentals of Requirements Engineering

<https://gaudisite.nl/FundamentalsOfRequirementsPaper.pdf>

*optional*



# Concept Selection

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## *core*

Concept Selection, Set Based Design and Late Decision Making

<https://gaudisite.nl/SEFconceptSelectionSlides.pdf>

## *optional*

Concept Selection - Applying Pugh Matrices in the Subsea Processing Domain by Linda Lønmo and Gerrit Muller; INCOSE 2014 in Las Vegas

[https://gaudisite.nl/INCOSE2014\\_Lonmo\\_Muller\\_ConceptSelection.pdf](https://gaudisite.nl/INCOSE2014_Lonmo_Muller_ConceptSelection.pdf)

Researching the application of Pugh Matrix in the sub-sea equipment industry by Gerrit Muller, Dag Jostein Klever, Halvard H. Bjørnsen, and Michael Pennotti; CSER 2011 in Los Angeles

[https://gaudisite.nl/CSER2011\\_MullerEtAl\\_ResearchingPughMatrix.pdf](https://gaudisite.nl/CSER2011_MullerEtAl_ResearchingPughMatrix.pdf)

# Visualizing Dynamic Behavior

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*core*

Visualizing Dynamic Behavior

<http://gaudisite.nl/info/VisualizingDynamicBehavior.info.html>

*optional*

Creating an A3 Architecture Overview; a Case Study in SubSea Systems by Gerrit Muller, Damien Wee, and Martin Moberg; INCOSE 2015 in Seattle, WA, USA

[http://gaudisite.nl/INCOSE2015\\_MullerEtAl\\_SubseaOverviewA3.pdf](http://gaudisite.nl/INCOSE2015_MullerEtAl_SubseaOverviewA3.pdf)

*core*

Systems Engineering Fundamentals Supply Chain and Logistics

<https://gaudisite.nl/SEFsupplyChainSlides.pdf>

*optional*

Build to order [https://en.wikipedia.org/wiki/Build\\_to\\_order](https://en.wikipedia.org/wiki/Build_to_order)

P-D Ratios <https://oldleandude.com/2015/05/27/p-d-ratios/>

*core*

Systems Engineering Fundamentals Risk Management

<https://gaudisite.nl/SEFriskManagementSlides.pdf>

*optional*

Failure Mode and Effects Analysis

[https://en.wikipedia.org/wiki/Failure\\_mode\\_and\\_effects\\_analysis](https://en.wikipedia.org/wiki/Failure_mode_and_effects_analysis)

# Readiness Levels

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Course Systems Integration; Readiness Levels

<http://www.gaudisite.nl/info/MSIreadinessLevels.info.html>

*optional*

From TRL to SRL: The Concept of Systems Readiness Levels

CSER 2006, Brian Sauser et al.

Technology Readiness Levels

[https://en.wikipedia.org/wiki/Technology\\_readiness\\_level](https://en.wikipedia.org/wiki/Technology_readiness_level)

# Systems Integration Process and Positioning

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Mastering Systems Integration; Process and Positioning

<http://gaudisite.nl/info/MSIprocessAndPositioning.info.html>

*optional*

SESA /SARCH Module 01, System Architecture Context

<http://gaudisite.nl/info/ModuleSystemArchitectureContext.info.html>

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Course Systems Integration; Project Management

<http://gaudisite.nl/info/MSIprojectManagement.info.html>

*optional*

Combating Uncertainty in the Workflow of Systems Engineering Projects

INCOSE 2013, Barry Papke and Rick Dove

# Verification and Validation Terminology

## *core*

Course Systems Integration; Terminology

<http://www.gaudisite.nl/info/MSIterminology.info.html>

## *optional*

Understanding Objective Evidence: (What It Is and What It Definitely Is Not),  
by Denise Dion

[http://www.eduquest.net/Advisories/EduQuest%20Advisory\\_ObjectiveEvidence.pdf](http://www.eduquest.net/Advisories/EduQuest%20Advisory_ObjectiveEvidence.pdf)

List of Cognitive Biases, Wikipedia:

[https://en.wikipedia.org/wiki/List\\_of\\_cognitive\\_biases](https://en.wikipedia.org/wiki/List_of_cognitive_biases)