



A better world through a systems approach



Chicagoland Spring Tutorial 2022

**'Lifecycle Concepts and Needs
Definition Group Project'
with Lou Wheatcraft**

May 7: Session 1 / Project Kickoff

May 12: Session 2 / Project Q&A

May 21: Session 3 / Project Presentations

Via Zoom



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Lifecycle Concepts & Needs Definition Spring 2022 Seminar

INCOSE ChicagoLand Chapter

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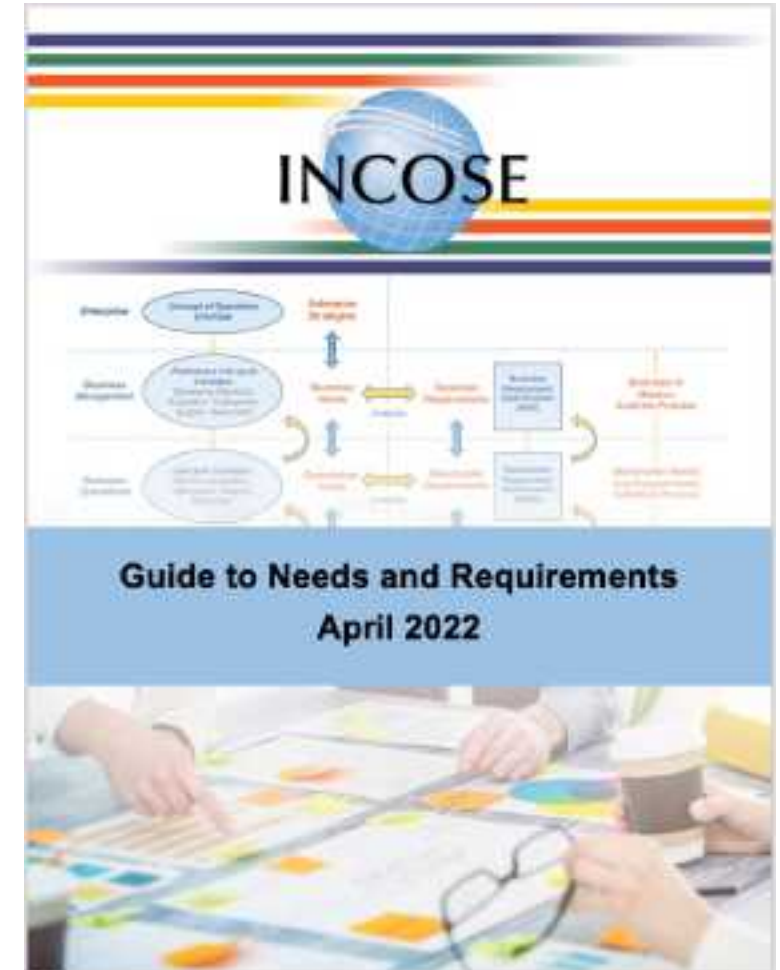
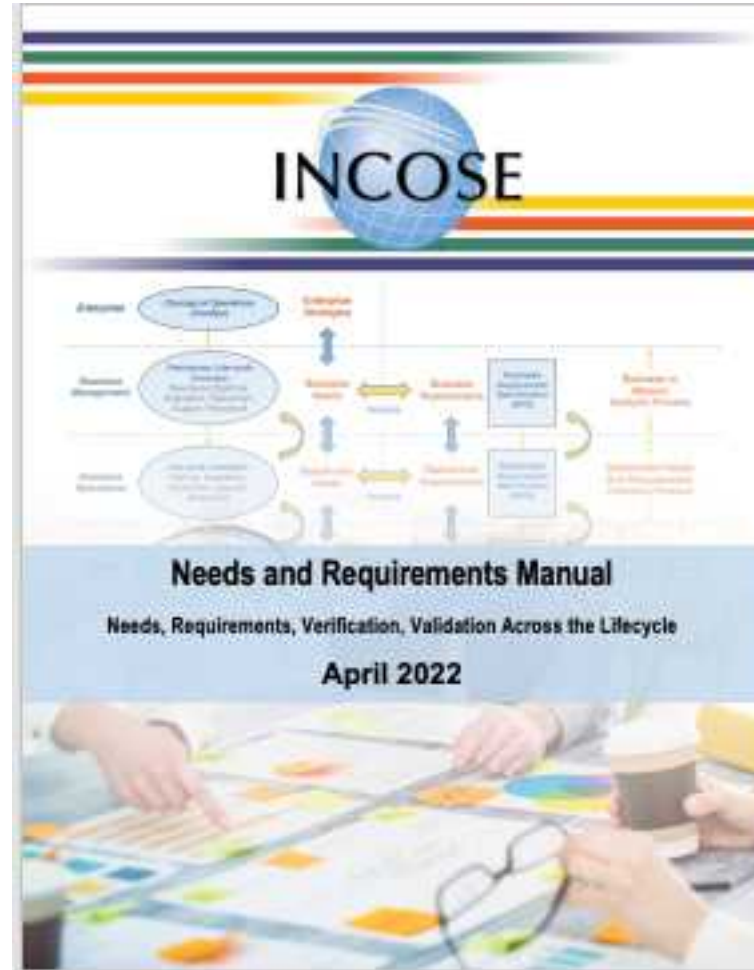
Lifecycle Concepts & Needs Definition Seminar



This seminar reflects current best practices as defined in the INCOSE Requirement Working Group (RWG) latest products that are more appropriate for today's increasingly complex, software centric systems.

Focus is on

- lifecycle concept definition, analysis, and maturation
- defining an integrated set of needs



Outcomes



Attendees will develop skills and knowledge that enable them to:

- Identify the need for, and benefits of, defining lifecycle concepts and needs prior to defining the design input requirements
 - Describe the major activities and resulting knowledge and artifacts involved in defining lifecycle concepts and needs
 - Define the problem (or opportunity) being addressed by the system under development.
 - Understand the importance of documenting the mission, goals, objectives, and MOS that define the desired outcomes and success criteria for the SOI being developed
 - Explain the importance of identifying stakeholders and learn methods to help elicit stakeholder expectations, needs, and requirements
 - Describe the importance of identifying drivers, constraints, and risks,
 - Understand the need to identify, define, and manage external interfaces
 - Describe the importance of and the steps needed to develop a set feasible lifecycle concepts for both the project team and the SOI before documenting and baselining stakeholder needs
- Understand the importance of validating and baselining the integrated set of needs before transforming them into the set of design input requirements

Seminar Approach



- Different from past seminars!
- Done virtually
- Recommended prework before the online sessions
 - Listening to prerecorded presentations
 - Readings from the NRM
- Focus of lectures will be on applying the concepts in the NRM to a case study.
 - Assumes each attendee has completed the prework assignments
- Homework!
 - Participation is up to the attendees
 - Group exercises outside of the seminar online sessions
 - Group formation is up to the attendees
 - Each group will choose a case study consistent with the domain they work
- Groups who volunteer will present their case studies for class discussion



Requires a time commitment outside of the seminar.

You will get out of the seminar what you put into it!

Syllabus



- The seminar consists of a combination of self-study, individual or group exercises, and online sessions over three Saturdays.
- The first and third online sessions will be approximately 4 hours each. The second session will be 2-4 hours as needed.
- **Prework:** Prior to the online sessions, attendees are encouraged to:
 - View videos dealing with:
 - Basic underlying concepts for the NRM and GtNR
 - Organization of the NRM
 - Read Sections 1-5 of the NRM
 - Review the case study slides that will be the focus of the first presentation

Syllabus



- **Online sessions:**

- **First online session** (Saturday May 7) 4 hours
 - Focus on applying the concepts covered in the videos and reading assignments using a case study.
 - Rather than repeating the theory covered in the videos and reading assignments, the focus is the actual application of the theory.
- **Second online session** (Thursday May 12) 2-4 hours as needed
 - Will occur one week after the first session.
 - Unstructured session allowing the groups to interact with the instructor to ask questions concerning their group exercise.
 - While attendance is not mandatory, everyone is encouraged to attend as they will learn from the questions asked by other groups and will be able to apply what is learned to their group exercise.
- **Third online session** (Saturday May 21) 4 hours
 - Will occur the following week and will focus on the results of the group exercises, addressing attendee questions, and group discussion of the concepts and outcomes of the seminar.
 - Due to time considerations, not all group exercises will be able to be discussed in detail.
 - The plan is to discuss at least two different group exercise results and use the rest of the time for questions and open discussions.

Syllabus



- **Group formation**

- Attendees will be encouraged to form groups for the homework exercise.
- While individuals are not required to work in a group, working in a group is highly encouraged to get the most out of the seminar.
- Attendees will be provided a roster of those that have signed up for the seminar prior to the first session.
- This will save time in forming groups as well as allow groups to begin the group exercise prior to the first in-person session.
- For attendees that are students, if requested, attempts will be made to match students with a group consisting of seasoned practitioners.
- The groups could be formed by those working for the same company or individuals from a chapter that chose to work together.

Syllabus



- **Group Exercise**

- Will be conducted by the attendees during the 2-weeks in-between the first and final in online sessions.
- The exercise will involve applying the concepts covered in the reading and the first session to a real-world project the attendees are involved.
 - This could be a past, current, or future project.
 - The SOI could be a medical device, consumer product, or other product of the group's choosing.
 - It could be work related or some other representative system the group chooses to use for the exercise.
- Attendees will need to abide by their organization's proprietary information policies.
- Groups will be responsible for making arrangements concerning their interaction and discussions for conducting the group exercise outside of the scheduled online sessions.
- Groups can interact with the instructor via email and during the second online session.

Intended Audience



- The knowledge gained from attending this seminar is critical for those stakeholders
 - Responsible for defining lifecycle concepts and defining an integrated set of needs against which the SOI will be validated.
 - That will be involved in project management, systems engineering, product development across the SOI lifecycle.
 - VIPs: Anyone with a **V**ested interest, has **I**nfluence, and will be **P**articipating in the development of the SOI
- Stakeholders that will benefit include:
 - System Engineers, product developers
 - Specialty Engineers (Compliance, Safety, Security, Risk, Human Factors, etc.)
 - Architects, Designers
 - Needs and Requirements Engineers
 - Integrators
 - Verifiers, Validators
 - Users and Operators
 - Maintainers
 - Program and Project Managers
 - Marketing
 - Business Analysts
 - Customers
 - Contracting

Register for the Seminar



- Register here:
<https://bit.ly/3Nb6KI0>

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Questions and Discussion

Lou Wheatcraft



- **Lou Wheatcraft** is a senior consultant and managing member of Wheatland Consulting, LLC. Lou is an expert in systems engineering with a focus on needs and requirements development, management, verification, & validation. Lou provides consulting and mentoring services to clients on the importance of well-formed needs & requirements helping them implement needs & requirement development and management processes, reviewing and providing comments on their needs and requirements, and helping clients write well-formed needs & requirements.
- Specialties include: Understanding and documenting the problem; defining project & product scope; defining and maturing system concepts; assessing, mitigating, & managing risk; documenting stakeholder needs; transforming needs into well formed design input requirements; allocation, budgeting, and traceability; interface management, requirement management; & verification and validation.
- Lou's goal is to help clients practice better systems engineering from a needs & requirements perspective across all life cycle stages of system/product development. Getting the needs & requirements right upfront is key to a successful project. Poor needs & requirements can triple the chances of project failure.
- Lou has over 50 years' experience in systems engineering, including 22 years in the United States Air Force. Lou has taught over 200 requirement seminars over the last 21 years. Lou supports clients from all industries involved in developing and managing systems and products including aerospace, defense, medical devices, consumer goods, transportation, and energy.
- Lou has spoken at Project Management Institute (PMI) chapter meetings and INCOSE conferences and chapter meetings. Lou has published and presented many papers concerning needs and requirement for NASA's *PM Challenge*, INCOSE, INCOSE *INSIGHT Magazine*, and *Crosstalk Magazine*. Lou is a member of INCOSE, past Chair and current Co-Chair of the INCOSE Requirements Working Group (RWG), a member of the Project Management Institute (PMI), the Software Engineering Institute (SEI), the World Futures Society, and the National Honor Society of Pi Alpha Alpha.
- Lou has a BS degree in Electrical Engineering from Oklahoma State University; an MA degree in Computer Information Systems; an MS degree in Environmental Management; and has completed the course work for an MS degree in Studies of the Future from the University of Houston – Clear Lake.