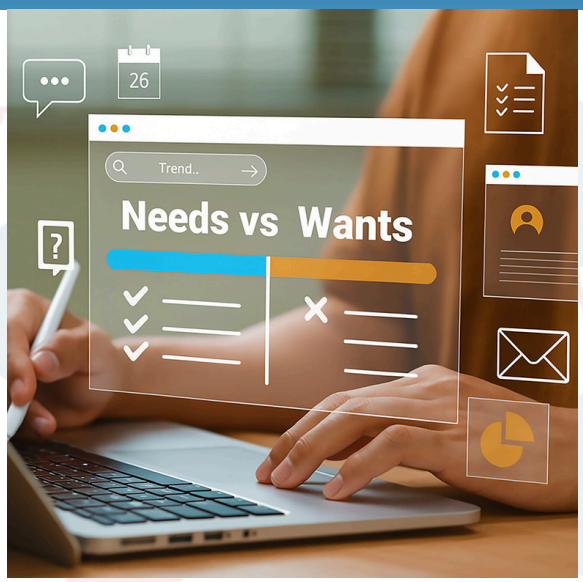
THE UNIVERSITY OF ARIZONA
COLLEGE OF ENGINEERING
Systems & Industrial Engineering

SIE 501 - ADVANCED REQUIREMENTS ENGINEERING METHODS

COURSE DESCRIPTION

This course explores **advanced concepts in requirements engineering**, focusing on both practical problem formulation and research advancements. Topics include problem space classification, distinguishing problems from solutions, formal modeling, syntax and ontologies, mission-driven elicitation, systems architecture-based decomposition, mixed-formulation approaches, traceability, for identifying essential requirements and gaps.



EXPECTED LEARNING OUTCOMES

- Elicit and formulate high quality stakeholder needs.
- Derive and formulate high quality system requirements.
- Decompose system requirements into high-quality component requirements.
- Apply traceability techniques to identify orphan requirements and unaddressed needs.
- Choose the right formulation strategy for different problem types.
- Describe the state of the art in problem formulation.

COURSE FORMAT

- The course will utilize lectures, in-class discussion, and progressive development of a requirements portfolio (for master students) and a research paper (for doctoral students).

- Each module contains archives of classroom lectures and discussions, presentations, notes and other instructional materials on each session's topic, and assignments.

PROGRAM DIRECTOR
Dr. Alejandro Salado
alejandrosalado@arizona.edu

ENROLLMENT
Graduate Coordinator
graduateadvisor@sie.arizona.edu

COURSE SCHEDULE

SESSION 0.5
- Course introduction and Overview
- Recap of systems theory relevant to needs and requirements

SESSION ONE - TWO
- Elicitation
- Formulation of stakeholder needs

SESSION THREE - FOUR
- Derivation of system requirements

SESSION FIVE - SIX
- Decomposition of system requirements into component requirement

SESSION SEVEN
- State of the art in problem formulation

Pioneering SE since 1961

Built-in MBSE/DE

Bridge Theory & Practice

Hands-on Virtual Lab

Distinguished Faculty

MASTERING DISRUPTIVE TRANSFORMATION & **LEADING THE FUTURE** OF SYSTEMS ENGINEERING