



Learning Outcomes

Systems Thinking

Core & Specialized Credentials

International Certification Alliance

Version 1.0 — August 2026



LICENSING INFORMATION

The work in this document was facilitated by the International Certification Alliance (ICA) and done through the contributions of various experts and practitioners. These learning objectives are intended to help the growing Tomorrow-Ready™ community worldwide.

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HOW TO READ THIS DOCUMENT

This document outlines the learning outcomes that accredited member organizations must address to offer ICA's System Thinking certification. To achieve a certification, a learner must complete the core credential plus at least two specialized credentials.

Each learning outcome (LO) follows a particular pattern, described below.

O.O Learning Outcome Name

Additional Context, describing why this Learning Outcome is important or what it is intended to impart.

The learning outcome's purpose further describes what is expected to be imparted to the learner (e.g., a key point, framework, model, approach, technique, or skill).

CORE CREDENTIAL LEARNING OUTCOMES

Systems Thinking Core

Systems Thinking is an 8-hour Core Credential for professionals who need to understand how the parts of an organization or process interact, why well-intentioned changes produce unexpected results, and how to intervene in ways that improve a system rather than just a symptom, an ability that grows more important as technology and global operations make organizations more interconnected.

1. Seeing Systems: Structure and Interconnection

1.1 Systems Thinking and Interconnection

Problems are often explained through isolated events or individual actors, while the relationships and structures producing those events remain hidden. Systems thinking shifts attention to those interconnections.

Build learners' understanding of systems thinking as a practical way to see the structure behind events, along with a shared vocabulary for describing it.

1.2 Recognizing Different Types of Situations

Some situations are difficult because they contain many parts; others are difficult because relationships change over time and cause and effect are delayed or unclear.

Develop learners' ability to recognize when a situation requires systemic reasoning rather than more detailed analysis of individual parts. Cover the difference between a complicated system with many variables but stable relationships versus a complex system where changes create feedback loops and unintended consequences.

2. Feedback, Behavior, and Unintended Consequences

2.1 Feedback Loops and System Behavior

System behavior over time is often shaped by reinforcing and balancing feedback loops rather than a single cause. These loops can amplify change or pull a system back toward stability.

Develop learners' ability to trace how feedback loops produce growth, stability, or decline over time.

2.2 Unintended Consequences of Intervention

Interventions aimed at visible symptoms can create new problems elsewhere when delays, feedback, or competing goals are ignored. These side effects often follow recurring patterns and are structural rather than accidental.

Develop learners' ability to recognize common patterns where an intervention produces unintended effects elsewhere in a system such as fixing a symptom while the cause worsens, solving one group's problem by creating another's, or gaining short-term relief before the system adapts around the change.

3. Mapping and Diagnosing Systems

3.1 Systems Mapping

A system's structure becomes easier to reason about when actors, relationships, delays, and loops (such as decision latency, handoffs, and approval gates) are drawn rather than described.

Develop learners' ability to use mapping as a thinking tool by drawing a system's structure to see relationships a description leaves implicit. The map here is a means rather than a deliverable; what matters is what becomes visible in the act of drawing it.

3.2 Finding Leverage Points

Not all interventions have equal effect. Changes to goals, information flows, or feedback structures can be more powerful than adjustments aimed only at symptoms or surface-level parameters.

Develop learners' ability to locate where a change to a system would actually matter, and to say why at that point rather than the more obvious symptom-level one. Introduce approaches such as leverage-point analysis, systems archetypes, or root-structure design.

3.3 Revisiting System Boundaries and Assumptions

Every system view is built on boundaries and assumptions that may become outdated as conditions change. A useful system view needs periodic review rather than being treated as fixed.

Develop learners' ability to revisit system boundaries and assumptions as new information emerges. Introduce multiple review practices such as boundary review, assumption testing, or iterative system modeling.

SPECIALIZED CREDENTIAL LEARNING OUTCOMES

Problem Framing and Root Cause Analysis

Problem Framing and Root Cause Analysis is a 2–4 hour Specialized Credential for professionals who want to develop their ability to define problems clearly, distinguish symptoms from causes, and focus analysis on the right question. The course focuses on framing discipline, assumptions, causal inquiry, and problem statements that support action. Learners will explore the value of framing, assumptions and boundaries, causal inquiry, and problem–statement quality.

1.1 The Value of Framing

Teams often analyze the first version of a problem they hear. This can lead them to solve symptoms, preferences, or inherited assumptions rather than the underlying issue.

Build learners' understanding of problem framing as a critical first step in analysis.

2.1 Assumptions and Boundaries

Problem definitions are shaped by what is included, excluded, assumed, and valued. Making these choices visible helps prevent the frame from being mistaken for objective reality.

Develop learners' ability to make the boundaries of a problem definition visible and testable. Cover what has been included, what has been left out, and whose view of the problem the frame reflects.

3.1 Causal Inquiry

Root-cause work becomes superficial when familiar explanations or visible symptoms are accepted as causes too quickly. A disciplined inquiry separates symptoms from underlying causes and explores contributing factors, interactions, and the evidence needed to test them.

Develop learners' ability to conduct a structured root-cause analysis that distinguishes symptoms from underlying causes.

4.1 Problem Statement Quality

A useful problem statement is specific, evidence-informed, actionable, and neutral enough to allow more than one possible solution.

Develop learners' ability to assess and strengthen problem statements before solution design begins.

Systems Mapping

Systems Mapping is a 2–4 hour Specialized Credential for professionals who want to develop their ability to visually represent a system's structure and use that map to diagnose where recurring problems actually come from.

1.1 Impact of Visual System Mapping

Narrative descriptions can hide relationships, loops, delays, and dependencies by turning a system into a sequence of events or list of actors. Mapping makes those structures explicit.

Build learners' understanding of the impact mapping has as a distinct step in systems analysis rather than only an illustration.

2.1 System Elements, Relationships, and Feedback

Useful system maps depend on identifying the actors, conditions, relationships, and feedback loops that actually shape behavior. Missing an important relationship can distort the whole map.

Develop learners' ability to identify the structural elements that belong in a system map.

3.1 Building a System Map Design

Creating a usable map requires invisible assumptions to be made explicit. Decisions about scope, level of detail, delays, handoffs, collaboration, and feedback loops. The result needs to be clear enough for someone other than the author to follow.

Develop learners' ability to produce a system map that is both diagnostically useful and understandable to others. Cover the scoping and detail decisions that determine whether a map is usable, and how to test it against a reader rather than against the author's own understanding.

4.1 Diagnosing from the Map

A map becomes useful when it helps explain why a problem keeps recurring or where the system structure is producing the visible symptom.

Develop learners' ability to use a system map as a diagnostic tool rather than a static artifact.

Systemic Intervention Design

Systemic Intervention Design is a 2–4 hour Specialized Credential for professionals who want to develop their ability to design interventions in complex systems that hold up over time instead of producing new problems elsewhere.

1.1 Why Interventions Backfire

Interventions can fail in recurring ways: fixing symptoms while causes worsen, solving one group's problem by creating another's, or succeeding briefly before the system adapts around them.

Develop learners' ability to use common backfire patterns to anticipate how a proposed intervention could produce unintended consequences.

2.1 Structural Resistance to Intervention

Systems resist change through structural forces and through human and emotional resistance. Recognizing both early improves intervention design.

Develop learners' ability to identify both structural (such as competing goals, informal incentives, and dynamics that pull behavior back toward an existing pattern) and human or emotional sources of resistance (such as fear, loss of status, or fatigue) before designing an intervention.

3.1 High–Leverage Intervention Design

An intervention placed at the right point can still fail. Systems push back through the competing goals, incentives, and habits that made the current pattern stable. A design that does not anticipate that push will need constant reinforcement to stay in place.

Develop learners' ability to design interventions that account for the resistance the system will produce and can hold without continuous effort. Cover what makes a design durable: whether it changes the structure generating the behaviour, whether it survives the loss of its sponsor, and what it costs to maintain.

4.1 Durability of Systemic Change

Durability needs to be assessed over time rather than at one moment.

Develop learners' ability to determine whether an intervention produced durable change or if the system reverted to old habits, workarounds, or conditions. Introduce techniques such as before-and-after comparison, drift detection, or outcome-versus-activity review.

Innovation and Creative Problem Solving

Innovation and Creative Problem Solving is a 2–4 hour Specialized Credential for professionals who want to develop their ability to generate novel, useful responses to problems that familiar approaches cannot solve.

1.1 What is Creative Problem Solving

Creativity is not a personality trait some people have, or a workshop the organization runs occasionally, rather it is a disciplined way of generating options once the obvious ones have run out.

Define creative problem solving as a structured approach that combines divergent thinking (generating multiple ideas) with convergent thinking (evaluating and refining) to produce novel, viable solutions. Emphasize that it differs from routine problem-solving because it explicitly challenges assumptions and constraints rather than accepting them. Illustrate how organizations rely on creative problem solving to drive innovation such as in developing new products, improving processes, or responding to disruptive challenges.

2.1 Reframing Problems to Open New Possibilities

Most problems that feel stuck are stuck because of an assumption that has never been questioned.

Build learners' ability to surface and challenge assumptions so they can reframe problems and open new possibilities. Challenge a range of assumptions such as who the solution is for, what constraints are fixed versus moveable, what counts as success, or what the problem actually is. This helps build the skill of reframing – the disciplined identification and interrogation of the assumptions that are limiting what solutions seem possible.

3.1 Idea-Generation Processes

Generating new and innovative ideas requires more than a brainstorming technique.

Develop learners' ability to create conditions that support genuine idea generation and test those conditions in practice. Cover the challenges that limit innovative ideas (such as: evaluation of ideas happens too early, social norms suppress unconventional suggestions, the problem is defined too narrowly, and the people in the room all share the same perspective) and approaches to address those challenges.

4.1 Moving from Ideas to Selection

Creative ideas often stall between generation and action.

Build learners' judgment for evaluating early-stage ideas and moving the strongest options forward. Some of the challenges in moving ideas forward are: indecision, risk aversion, unclear ownership, and the existing ways of working, etc. Introduce criteria for evaluating ideas such as potential value, risk, cost of delay, key assumptions, testability.

Hybrid Delivery Planning

Hybrid Delivery Planning is a 2–4 hour Specialized Credential for professionals who want to develop their ability to plan and manage delivery work that spans multiple approaches simultaneously. Most organizations do not operate with a single delivery approach. Teams might run sprints alongside phase-gated programs, continuous improvement work sitting alongside fixed-scope projects, and external dependencies connect agile teams to suppliers and regulators who operate in entirely different rhythms. This course equips practitioners to design delivery that is coherent across these boundaries rather than forcing everything into a single approach.

1.1 Hybrid Delivery Environments

Teams within organizations and partners often operate in different approaches. Hybrid delivery is therefore a common result of organizational complexity.

Build learners' understanding of why hybrid delivery emerges and why it requires deliberate coordination. Teams and partners might choose a different approach due to different delivery rhythms, governance requirements, and levels of uncertainty. For example, mergers or acquisitions often bring together teams with genuinely different established methods, creating a coordination challenge around reconciling incompatible cadences and terminology. Or, regulated and safety-critical components of a larger effort may require a more structured approach even while the rest of the organization works iteratively, creating a challenge around syncing a fixed-schedule workstream with flexible ones.

2.1 Hybrid Delivery Integration Points

Hybrid delivery most often fails at the boundaries between approaches. Different planning cycles, approvals, and change mechanisms can create delays and conflicting expectations.

Develop learners' ability to identify and manage integration points between different delivery approaches. For example, mismatched planning cycles create a risk that an iterative team commits to something a structured partner can't actually accommodate until their next fixed planning window; different approval or change processes create a risk that a change agreed to informally in one team's fast cadence sits waiting for a slower formal sign-off elsewhere.

3.1 Coherent Hybrid Delivery Planning

A hybrid plan needs to connect delivery tracks without forcing artificial consistency.

Develop learners' ability to create an integrated hybrid delivery plan that coordinates different approaches while preserving their useful differences. A hybrid delivery plan highlights cross-track dependencies, communication expectations, change handling, and escalated coordination action approaches.

4.1 Hybrid Delivery Coherence and Risk

Hybrid plans can drift as tracks move out of sync or integration points fail. Ongoing review helps determine whether the approach still fits the organization and delivery reality.

Develop learners' ability to assess hybrid delivery for coherence, integration risk, and contextual fit. For example, two tracks that were well-synchronized at kickoff can drift as one accelerates and the other hits a regulatory delay, or an integration point that worked fine early on can start silently failing once volume or complexity increases past what it was designed to handle.

Improving Flow

Improving Flow is a 2–4 hour Specialized Credential for professionals who want to develop their ability to make work visible and improve the movement of work through a system. This credential focuses on work visualization, work in progress, blockers, dependencies, queues, policies, forecasting, and flow-oriented conversations that improve delivery outcomes.

1.1 Work Visualization and Flow

Knowledge work is often complex, making flow and progress difficult to detect and communicate. Visual systems create a shared understanding of how work is moving.

Build learners' understanding of visualization as a foundation for managing flow and collaboration. Visualization aids in making overload, delay, dependencies, and blocked work transparent.

2.1 Flow Constraints

Flow can be constrained by a variety of factors that are usually system conditions rather than individual performance problems.

Develop learners' ability to diagnose where flow slows and which systemic conditions contribute to delay. Constraints could include excess work in progress, queues, waiting, dependencies, batch size, rework, and context switching.

3.1 Flow Improvement

Flow improves through small, testable changes rather than broad process redesign. Teams need a clear constraint, a reversible intervention, and an early measure of whether the experiment is helping improve the flow of work to done.

Develop learners' ability to design practical, measurable experiments that improve flow without over-controlling work.

4. Ethical Use of Flow Measures

Flow metrics can support system improvement but become harmful when used as isolated data points or used to judge individual performance. Interpretation needs context and attention to what the measure actually represents.

Develop learners' ability to interpret flow measures constructively and avoid performance-management misuse. For example, a rising cycle time across a team reveals something real about the system, like growing work-in-progress or a bottleneck at a specific handoff, but using that same cycle time to rank individual engineers against each other misuses the measure.

Designing for Delivery Team Effectiveness

Designing for Delivery Team Effectiveness is a 2–4 hour Specialized Credential for professionals who want to develop their ability to build and sustain the structural and environmental conditions that enable delivery teams to perform consistently. High-performing delivery teams do not emerge by accident. They require deliberate attention to team structure, clarity of purpose and accountability, feedback mechanisms, and the removal of systemic obstacles that inhibit flow. This credential focuses on the delivery leader's role in creating those conditions rather than on interpersonal team dynamics.

1.1 Team Structure for Delivery Performance

Team composition, size, location, interfaces, and work flow directly affect delivery speed, quality, and adaptability. Team structure is therefore a delivery design choice, not only an HR concern.

Build learners' understanding of how structural team choices influence delivery performance. For example, team size affects communication overhead, since coordination cost grows faster than headcount as a team gets larger; distributed location affects the speed of informal problem-solving, since quick clarifications that happen in passing in person require more deliberate effort across time zones; and unclear interfaces between teams affect handoff speed, since work can sit waiting at a boundary no one owns.

2.1 Team Purpose and Clarity

Teams underperform when a shared purpose and success criteria are unclear. These clarity gaps create friction even when skill is strong.

Develop learners' ability to diagnose clarity gaps that constrain delivery team performance. A shared purpose gives a team a common basis for making the countless small trade-off decisions delivery requires. Without a shared purpose that's explicit and agreed upon, individuals default to their own reasonable but conflicting assumptions, and delivery suffers from friction that looks like a people problem but is really a clarity problem.

3.1 Misaligned Incentives

An organization can genuinely want cross-team collaboration or shared ownership of outcomes while its reward structure quietly tells individuals the opposite.

Develop learners' ability to recognize when a team's behavior isn't a mindset or culture problem but a predictable response to how success is measured and rewarded. For example, individual bonus targets tied to personal ticket count can quietly discourage someone from pairing with a struggling teammate, since time spent helping doesn't count toward their own number, even if the organization's stated value is collaboration.

4.1 Systemic Obstacles to Team Performance

Persistent delivery problems often come from a systemic obstacle rather than individual effort. Systemic obstacles require structural responses.

Develop learners' ability to diagnose systematic obstacles, such as delayed approvals, competing priorities, weak tools, or organizational policies that constrain delivery team performance. For example, a slow, multi-layered approval process might call for delegating decision authority down to the team level for lower-risk changes, or a weak shared tool everyone depends on might call for securing budget to replace it rather than asking each team to build individual workarounds.

Systems Coaching

Systems Coaching is a 2–4 hour Specialized Credential for professionals who want to extend their coaching practice beyond an individual or intact team to a wider relationship system. Learners develop the ability to recognize recurring patterns across teams, functions, roles, boundaries, and stakeholder groups; examine different perspectives, power dynamics, dependencies, and tensions without locating the problem in one part of the system; and establish shared purpose and working expectations across multiple stakeholders. Through practice and reflection, learners strengthen their ability to facilitate basic boundary-spanning coaching interventions that support greater shared awareness and choice and to evaluate impact and responsible practice across a multi-party coaching engagement.

1.1 Systems Coaching

Some challenges are created and sustained through relationships, roles, boundaries, and interactions across multiple parts of an organization. Systems coaching treats the wider relationship system as the client rather than locating the issue within one person or intact team.

Develop learners' understanding of systems coaching as a distinct practice focused on the wider relationship system as the client. Build learners' ability to distinguish systems coaching from individual and team coaching; recognize when a challenge spans teams, functions, roles, or stakeholder groups and is appropriately addressed at the wider system level; and shift attention from identifying who is causing the problem to understanding how the broader system is producing or sustaining the pattern.

2.1 Patterns, Roles, and Dynamics Across the System

Wider relationship systems contain recurring patterns, roles, boundaries, power dynamics, alignments, and tensions that no single stakeholder can fully see from their own position.

Develop learners' ability to notice patterns across multiple stakeholders without reducing the situation to one person's perspective or explanation. Build learners' capacity to examine recurring interactions, formal and informal roles, boundaries, power, alliances, dependencies, and tensions; compare different stakeholder perspectives; and distinguish what is observable from assumptions about why the system behaves as it does.

3.1 Coaching Across System Boundaries

Systems coaching often requires working across team, functional, role, or stakeholder boundaries. Interventions need to serve the wider system rather than reinforce one group's agenda or oversimplify a complex pattern.

Develop learners' ability to create and rehearse basic boundary-spanning coaching interventions that help multiple parts of a system see and work with shared patterns. Build learners' capacity to establish shared purpose and working expectations with relevant stakeholders, bring different perspectives into dialogue, clarify boundaries and interdependencies, and help the system generate greater awareness and choice without positioning the coach as the expert who diagnoses or fixes the system.

4.1 System Impact and Multi-Party Ethics

Systems coaching involves multiple parties with different interests, levels of power, and expectations about confidentiality or outcomes. Its effectiveness should be judged by meaningful change in the wider relationship system, not by whether individual stakeholders felt satisfied.

Develop learners' ability to evaluate both the impact and ethical quality of systems coaching across multiple stakeholders. Build learners' capacity to recognize evidence of relational shift, improved alignment, healthier interaction across boundaries, or increased capacity for the system to work with its own tensions; consider confidentiality, power, competing interests, and sponsor expectations; and avoid claiming impact that the evidence does not support.

Adoption Design

Adoption Design is a 2-4 hour Specialized Credential for practitioners who want to design interventions that help people move from awareness of a change to genuine adoption of new behaviors and ways of working.

1.1 Conditions for Sustained Adoption

Awareness and training do not guarantee adoption. Sustained behavior change also depends on motivation, opportunity, capability, reinforcement, and removal of barriers that make old behaviors easier to continue.

Build learners' understanding of adoption as a distinct design challenge beyond communication and training. In practice, someone can fully understand a new process and still slide back into the old one because it's simply easier, faster, or more familiar under pressure, especially if nothing in the environment reinforces the new way or removes the path back to the old one.

2.1 Diagnosing Adoption Barriers

Adoption can be blocked by incentives, skills, habits, unclear roles, inadequate tools, leadership inconsistency, workload, or cultural norms. Effective intervention begins with identifying the actual barrier.

Develop learners' ability to distinguish root adoption barriers from visible symptoms. A team might resist a new process because their incentive structure still rewards the old behavior, or because leadership models one thing while saying another, and neither of those is solved by explaining the change more clearly.

3.1 Designing Adoption Interventions

Change initiatives fail because adoption support is generic or missing. Designing adoption interventions tailored to actual barriers and reinforced over time is what makes new behaviors lasting.

Develop learners' ability to design and sequence adoption interventions that reinforce new behavior over time. Adoption interventions may include practice, manager reinforcement, workflow changes, incentives, job aids, modeling, accountability, and feedback. The right mix should reflect the specific barriers diagnosed.

4.1 Measuring Adoption

Training completion or tool access does not prove that people are working differently. Adoption measures need to show whether new behavior is occurring, continuing, and contributing to intended outcomes.

Develop learners' ability to distinguish genuine behavior change from surface compliance using meaningful indicators. Learners should be able to tell the difference between a metric that shows people did what was required and one that shows the new behavior is actually happening, sticking, and moving the needle on the outcome the change was meant to produce in the first place.

SPECIAL THANKS

ICA would like to give special thanks to the contributors:

Kerri Sutey · Paulo Dias · Christina Hartikainen · Tricia
Broderick · Thiago Brant · Evan Leybourn