HUMAN SYSTEMS INTEGRATION

Human Systems Integration is an approach to the engineering of systems containing humans.

Five Day Course

This world-leading course focuses on cognitive issues, which are particularly challenging for Human Systems Integration because standard engineering methods do not capture the essential complexities of cognition. This course introduces delegates to specialized methods of human systems analysis and design, and illustrates how those methods can be used to enhance performance and safety within large-scale socio-technical systems. The course, while standing alone, complements PPI's 5-day systems engineering course.

Attendance at public courses and on-site delivery in Australia may be eligible for SADI funding.

This course is recognized by Engineers Australia for CPD purposes (40 Hours)

Who Should Participate in This Course?

Anyone directly involved with analysis and design of human-systems functionality or who develops sub-systems with which humans must interact will benefit from this course. Additionally, program managers who hire and task human-systems analysts and designers or who must assess the overall potential of envisioned or existing human-centric systems will benefit, for example:

- All designers of systems that include humans as operators, users, patients, professional staff, or managers
- Human-systems integrators
- Specifiers of user interfaces
- Designers of user interfaces
- Designers responsible for usability
- Systems engineers
- Software engineers who implement user requirements
- System safety engineers
- Engineering managers and team leaders

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COURSE OUTLINE

0. **Introduction – What is Human Systems Integration?**
1. **Introduction (1.5 hours)**
   - Introducing the course & your instructor
   - Course Overview
2. **Information Management Exercise (1 hour)**
   - Team Cognition (group exercise & debrief)
3. **Cognitive Task Analysis Part 1 (3 hours)**
   - Naturalistic Decision Making
   - Decision Centered Design
4. **Cognitive Task Analysis Part 2 (1 hour)**
   - Macro-Cognition
5. **Cognitive Analysis & Modeling for Systems Engineering (30 mins)**
   - Video: Cognitive Analysis & Modeling for Systems Engineering
6. **Cognitive Task Analysis, Part 3 (1.5 hours)**
   - Team Cognition
   - Decision Centered Design for Teams
7. **Organizational Cognition (2 hours)**
   - Organizational Cognition
   - Cognitive Task Analysis for Organizational Cognition
   - Cognitive Task Analysis; Summary Review
8. **What is Human Systems Integration? (1.5 hours)**
   - Introduction to Human Systems Integration
   - The Nature of Cognitive Work
9. **Entry to Systems Analysis (1 hour)**
   - System Boundary Analysis
10. **Cognitive Work Analysis, Part 1 (30 mins)**
    - What is Cognitive Work Analysis?
    - Introductory thoughts on design (video) – (optional extra)
11. **Cognitive Work Analysis, Part 2 (2.5 hours)**
    - Work Domain Analysis Introduction
    - Work Domain Analysis (Foundations)
    - Work Domain Analysis (Issues)
12. **Cognitive Work Analysis, Part 3 (2.5 hours)**
    - Work Domain Analysis (Controversies)
    - Work Organization Analysis
    - Social Transactions Analysis
13. **Cognitive Work Analysis, Part 4 (1.25 hours)**
    - Work Domain Analysis, Joker One; Work Organization Analysis, Joker One
14. **After Action Review (45 mins)**
    - After Action Review (Movie); After Action Review (Slides)
15. **Cognitive Work Analysis, Part 5 (1 hour)**
    - Work Task Analysis, Joker One
    - Decision Ladders for Recognition-Primed Decisions (optional)
16. **Cognitive Work Analysis, Part 6 (3 hours)**
    - Cognitive Strategies Analysis & Cognitive Competencies Analysis
    - Social Transactions Analysis, Joker One
    - Work Domain Analysis; Problem versus Solution Space
    - Design a "Divert" Command & Control system (group exercise),
    - Cognitive Work Analysis; Summary Review
17. **Cognitive & Systems Performance Metrics (2 hours)**
    - Cognitive & Systems Performance Metrics
    - Situation Assessment & Planning
18. **Return on Investment (25 mins)**
    - Return on Investment
19. **Cognitive Analysis Exercise (45 mins)**
    - Plan the analysis of a system you know
20. **Innovation for Cognitive Design (1.5 hours)**
    - Concept Development
21. **Cognitive Design (2 hours)**
    - Cognitive Design Patterns
    - Functional Workspace Design
22. **Cognitive Requirements (1 hours)**
    - Cognitive Requirements
23. **Spot the Cognition (1 hours)**
    - Movie; Houston, we have a problem!
24. **Summary (45 mins)**
    - Summary Review of Workshop
    - Workshop Evaluation

helping projects succeed...

Many failures in capability development that have led to cost overruns, schedule overruns and unsatisfactory operational capability have resulted from a fragile approach to Human Systems Integration. Competent application of the principles of Cognitive Systems Engineering during systems design and development can place Human Systems Integration on a more robust foundation. By tightly linking the principles and methods of Cognitive Systems Engineering to PPI's approach to systems engineering, this course demonstrates that systematic, detailed and progressive attention to issues of cognitive work adds considerable value to systems engineering processes, and at the same time, resolves many of the challenges that have led to cost, schedule and capability failures.