

Postgraduate Initiative in Project Engineering IX7201: System Acquisition Engineering

IX7201 Aims

- IX7201-AI:**
- Specify and develop the critical skills to assure “best price” and “best contract” for an acquisition.
- IX7201-A2:**
- Specify and develop the critical skills to design and organize technical sustainability of system.
- IX7201-A3:**
- Specify and develop the critical skills to define and organize ILS (Integrated Logistic Support).

IX7201 Learning Outcomes

- IX7201-LO1:**
- Review and analyse tools to engineer system acquisition at the strategic level of contracting authority (project executive).
- IX7201-LO2:**
- Critically analyse tools to plan and manage configuration.
- IX7201-LO3:**
- Critically analyse non-functional (RAMS - Reliability, Availability, Maintainability and Safety) requirements, and related ILS (Integrated Logistic Support).

IX7201 Expected Student Learning Activity

Total Learning time 200 hours:

- 36 hours contact time
- 164 hours independent study (team construction and real case analysis)

Students are expected to attend all lectures/seminars and actively engage with online learning resources.

IX7201 Assessment

Learning outcome IX7201-LO1 is assessed through:

- individual construction (1,000 words) of Qualification Questionnaire and Contract Award criteria (25%),
- and individual critical analysis (1,000 words) of similar construction by someone else (25%).

Learning outcome IX7201-LO2 is assessed through:

- a group presentation (equivalent 1,000 words - 25 minutes presentation and 5 minutes Q&A) of a configuration management plan (25%).

Learning outcome IX7201-LO3 is assessed through:

- reflective report (1,000 words) to analyse group presentation (by other groups): 25%.

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IX7201 Contents

IX7201-C1: Configuration planning for system acquisition

- Professional practices to integrate project WBS (Work Breakdown Structure) with system PBS (Product Breakdown Structure) and ABS (Assembly Breakdown Structure).
- Presentations, labs and preparation of independent study for system and project engineering integration.

IX7201-C2: Configuration management for systems

- Professional practices to integrate version plan for configuration items.
- Design and construction of configuration plans integrated with version plan of configuration items.
- Critical configuration review to assure sustainability of system.
- Presentations, labs and preparation of independent study for system configuration plan.

IX7201-C3: System support

- Professional practices to organise system maintenance and user support.
- Design and construction of document management (during entire lifetime) to assure maintainability.
- Presentations, labs and preparation of independent study to design support organization.

IX7201-C4: System support requirements

- Critical review to integrate functional requirement quality thresholds.
- Professional practices to determine uptimes and downtimes. Expression of required means for uptimes and downtimes.
- Critical analysis of Mean Time Between Failures to assure system reliability. Failure rate and key models to build system reliability.
- Professional practices to identify and to define system availability (related conventions).
- Critical analysis of redundancies to increase availability of a system.
- Presentations, labs and preparation of independent study of Support Requirements.

IX7201-C5: Integrated Logistic Support (ILS)

- Critical review of workflow for repairable units (RU) and not repairable unit (NRU): related analysis of unit stocks.
- Professional practices to relate quantification of stocks and maintainability requirements.
- Professional practices to analyze system maintainability and Mean Time To Repair.
- Critical analysis of testability of system related to maintainability, and eventually to cost of maintenance.
- Presentations, labs and preparation of independent study of ILS.

IX7201-C6: Acquisition process

- Review of European standard for public acquisition: Contract Notice, Expression Of Interest (EOI), Pre Qualification Questionnaire (PQQ), Invitation To Tenders (ITT), Award of Contract.
- Professional practices to determine lowest price (Consideration of Total Cost of Ownership - TCO).
- Critical review of award criteria, as well as weighting system, to determine best price.
- Presentations, labs and preparation of independent study of acquisition process criteria.

IX7201-C7: Acquisition contract negotiation

- Critical review of contract provisions: schedule, delivery, price, payment conditions, customer undertakings, testing, acceptance and transfer of title and risks.
- Presentations, labs and preparation of independent study of acquisition contract main articles.

IX7201-C8: Acquisition contract management

- Critical review of contract annexes, conflict resolution, “force majeure” and other contract limits.
- Presentations, labs and preparation of independent study of acquisition contract.