CONCEPT

Engineering Management: From Technical Expert to Engineering Manager

28 February – 4 March 2027
Riyadh - KAFD district five-star



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Introduction:

Engineering management often fails at the point of promotion: a strong design, maintenance or software engineer becomes responsible for a group of specialists and keeps solving problems personally, while reviews bottleneck, priorities drift and executives receive technical detail instead of decisions. This Core Concept course prepares engineers and technical specialists to move from expert contributor to engineering manager, managing knowledge workers, owning technical risk and quality, building engineering business cases and developing engineers. Participants work on a case engineering group and produce a 90-Day Engineering Management Plan.

Course Objectives:

- Redefine personal contribution when moving from senior engineer to engineering manager, separating hands-on design work from managerial accountabilities
- Delegate engineering tasks and structure technical reviews so that specialists own their designs while the manager retains sign-off control
- Prioritise an engineering workload of design, sustaining, maintenance and improvement work against capacity and technical debt
- Make and document engineering decisions under uncertainty using decision trees, expected value and trade-off matrices
- Build an engineering budget and business case and present technical risk to non-technical executives as options and consequences
- Coach engineers through technical career paths and resolve disagreements between engineers over design choices and standards

Target Audience:

- Senior engineers recently given responsibility for a design, maintenance, operations or software engineering group
- Technical specialists and principal engineers who supervise other specialists while still carrying technical authority
- Engineering section and discipline heads accountable for technical output, quality and headcount
- Plant, reliability and asset engineers promoted to lead engineering or technical services teams
- Laboratory, testing and technical services supervisors managing scientists, technologists and technicians

Course Outline:

Day 1: From Technical Expert to Engineering Manager

- Engineering Management Scope: Technical Authority Versus Managerial Accountability
- Expert-to-Manager Transition Audit: Time Allocation and Hands-On Work Mapping
- Engineering Manager Role Charter: Decisions Owned, Delegated and Escalated
- Engineering Group Current-State Scan: Capability, Workload and Technical Debt
- Stakeholder Map for an Engineering Manager: Operations, Finance and Executives

Day 2: Managing Knowledge Workers and Technical Specialists

- Knowledge-Worker Productivity Factors: Task Clarity, Autonomy and Continuous Learning
- Engineering Delegation Levels Matrix for Design, Calculation and Approval Tasks
- Technical Review Structure: Peer Check, Design Review Gate and Manager Sign-Off
- Engineering Standards and Design Authority Assignment Within the Group
- Motivation of Senior Specialists: Technical Challenge, Recognition and Mastery

Day 3: Planning, Prioritising and Deciding in Engineering Work

- Engineering Work Intake and Triage: Design, Sustaining, Maintenance and Improvement Requests
- Capacity Planning for an Engineering Group Using Skills and Hours Loading
- Technical Debt Register and Prioritisation Scoring
- Engineering Decisions Under Uncertainty: Decision Trees and Expected Value
- Design Trade-Off Matrix and Engineering Decision Record

Day 4: Technical Risk, Quality Ownership and the Engineering Business Case

- Technical Risk Ownership: Design Margins, Single Points of Failure and Escalation Triggers
- Engineering Quality Ownership: Defect Escapes, Lessons Learned and Pre-Mortem Review
- Engineering Budget Build: Labour, Tools, Testing and Contingency Lines
- Engineering Business Case Using Net Present Value, Payback and Risk-Adjusted Benefits
- Executive Briefing of Technical Issues: Options, Consequences and Recommendation Format

Day 5: Case Study: Building the 90-Day Engineering Management Plan

- Engineer Coaching Conversation Plan Using Technical Career Ladders
- Design Disagreement Resolution Between Engineers: Evidence-Based Decision Protocol
- Case Engineering Group Diagnosis: Workload, Risk and Skills Gaps
- 90-Day Engineering Management Plan Drafting: First 30, 60 and 90 Day Actions
- Plan Presentation to a Simulated Executive Panel and Peer Critique

Skills You Will Gain:

- Engineering Delegation
- Technical Review Governance
- Engineering Capacity Planning
- Technical Debt Prioritisation
- Decision Analysis Under Uncertainty
- Engineering Business Case Development
- Executive Technical Communication
- Engineer Coaching

Why Attend This Course:

- Leave with a 90-Day Engineering Management Plan tested on a case engineering group and critiqued by peers
- Stop acting as the bottleneck on every calculation and drawing while keeping control of technical quality
- Present engineering risks and funding requests in a form executives can approve
- Compare engineering management practice with engineers from energy, manufacturing, construction, utilities and software organisations

Conclusion:

Engineering groups perform when their manager stops being the best engineer in the room and starts building a group that engineers well without constant intervention. The week moves from the expert-to-manager transition, through managing knowledge workers and structuring technical review, to planning, prioritising and deciding under uncertainty, then to technical risk, quality ownership, budgets and executive briefings. The final day applies these methods to a case engineering group and produces a 90-Day Engineering Management Plan ready to discuss with a line director.