This Curriculum Guide will help you plan your learning journey through STEP Levels 2, 3 and 4. It provides a detailed listing of all the courses and activities that comprise the curriculum for the STEP discipline you’ve chosen.

For each STEP level there are three elements you must complete: Core and Discipline training courses, On-the-Job Training (OJT), and Qualification.

**CORE COMPETENCIES**

- **BUSINESS OF NASA**
  - Budgets, Contracting Principles, Governance Models and Legal, Risk Management, and Decision Analysis

- **FOUNDATIONS OF MISSION SUCCESS**
  - Engineering Principles, Requirements, Root Cause, Mishap Investigation, Corrective Actions, and Lessons Learned

- **PERSONAL EFFECTIVENESS**
  - Emotional Intelligence, Influence, Change Management, Leadership, Negotiations, Oral and Written Communications, Self-Awareness, Biases and Team Dynamics

**DISCIPLINE COMPETENCIES**

- **QUALITY EVALUATIONS AND DATA ANALYSIS**
  - Cost of Quality, Statistical Quality Control, Data Collection and Analysis, Process Effectiveness Measures, Earned Value

- **QUALITY ASSURANCE MANAGEMENT AND PLANNING**
  - Quality Management, Program Quality Integration, Technical Assessment, Quality Tools

- **DESIGN AND DEVELOPMENT CONTROLS**
  - Design Inputs and Reviews, Workmanship Standards, Design of Experiments, Drawings, Dimensions, Tolerances, Configuration Management, Data Management, Parts Control, Critical Systems

- **PROCUREMENT QUALITY ENGINEERING**
  - Risk Based Acquisition Management, Purchase Order Review, Pre-Award / Post-Award Surveys, Statement of Work, Flow Down of Requirements, Data Deliverables, Letter of Delegation, Government Mandatory Inspections Points, Key Characteristics

- **PRODUCTION, MATERIALS, AND PROCESS CONTROLS**
  - Manufacturing Processes; Electrostatic Discharge (ESD); Cleanliness and Contamination; Packaging, Handling, and Shipping; Launch Processing and Servicing; Material Control; Measuring Techniques

- **INSPECTION TESTING AND ACCEPTANCE ACTIVITIES**
  - Certification of Flight Readiness (COFR); Hardware/Software/Service Acceptance; Qualification, Validation, Verification; Nondestructive Inspection / Nondestructive Evaluation, Test, Inspection

- **PROBLEM REPORTING AND CORRECTIVE ACTIONS (PRACA)**
  - PRACA Systems, Material Review Board, NASA Advisories and Government Industry Data Exchange Program (GIDEP)

**ENROLL AND FIND OUT MORE INFORMATION**

- **STEP website:** nsc.nasa.gov/STEP

**TECHNICAL DISCIPLINE TEAM LEAD (TDTL)**

- Don Brandl
  - Donald.E.Brandl@nasa.gov
  - 256.961.4876

**NASA SAFETY CENTER HELP DESK**

- NASA-NSC-Help@mail.nasa.gov
  - 216.433.9672 (9NSC)
LEVEL 2

LEARNING OUTCOMES

• Describe budget and contracting processes and NASA’s governance model.
• Explain the mishap investigation process, SMA products in the lifecycle, and lessons learned processes.
• Recognize various Quality training aspects for flight readiness, contamination and material control, manufacturing processes, Quality management, calibration, and inspection practices.
• Implement Quality Assurance support for design and testing by reviewing technical documentation and drawings while associating non-destructive examination (NDE) practices or counterfeit part usage.
• Identify differing Quality audit approaches for configuration control, workmanship, manufacturing/facility readiness, acceptance criteria, and corrective action.
• Discover how NASA implements Lean Six Sigma, Letters of Delegation, procurement quality, problem reporting, risk management, and lessons learned for Quality Engineering throughout a project lifecycle.

CORE COURSES*

002-08  Mishap Investigation Roles and Responsibilities
002-09  Completing the Investigation and Mishap Report
002-10  Introduction to Root Cause Analysis
038-01  NASA Safety Reporting System
CORE-DA  Decision Analysis for STEP
CORE-FAR  Federal Acquisition Regulation (FAR) Overview
CORE-IPM  Introduction to Project Management for SMA
CORE-NBO  NASA Budget Overview for SMA
CORE-NGO  NASA Governance Overview for SMA
CORE-NLO  NASA Legal Overview for SMA
CORE-RFS  Requirements Development and Tailoring
CORE-CONT  Types of Contracts
CORE-RM  Risk Management for STEP
CORE-SPL  SMA Products in the Program/Project Lifecycle
QE-215  Overview of NASA Lessons Learned Information Systems
QE-261  Corrective Action and Problem Reporting Systems Overview
CORE-RM  Risk Management for STEP
SSFT  Building Personal Power through Influence
SSFT  Confronting Workplace Conflict
SSFT  Navigating Other People’s Emotions
SSFT  Navigating Your Own Emotions
SSFT  Organizations Change So Get Ready
SSFT  Take a Deep Breath and Manage Your Stress

CORE ON-THE-JOB TRAINING*

• Discuss the challenges, responsibilities, and lessons learned with the following roles: ex-officio, investigator, chair, mishap POC.
• Identify and review the Federal Acquisition Register clauses relating to Occupational Health and Public Safety.
• Identify systems your SMA office or procurement office uses to track the types of contracts at the center.
• Identify your center’s governance model and how it interacts with the Agency’s governance model and NASA Strategic Plan.
• Observe a project or Institutional Risk Board.
• Observe interactions between team members in meetings or on a project.
• Review a recent mishap investigation report.
• Become familiar with the NASA Lessons Learned Information System, select a topic of your choice, and analyze lessons learned.
• Review the report of the Columbia Accident Investigation Board.
• Review the requirements definition and requirements traceability documentation for a project.
• Review, support, or observe a developed project management plan.
• Review, support, or observe the process and products for a program cost estimate (Mission Directorate SMA Support or SMA organization).
• Trace a mishap corrective action plan.

* You only need to take Core once per level if pursuing multiple disciplines at same level.
DISCIPLINE COURSES

- QE-200 Introduction to Electrostatic Discharge
- QE-201 Advanced Electrostatic Discharge
- QE-202 Qualification and Certification of Additive Manufactured Parts for NASA Applications
- QE-203 Counterfeit Parts Awareness Overview
- QE-204 Parts Assurance
- QE-205 Supply Chain Risk Management
- QE-211 Quality Management Overview
- QE-213 Program Quality Integration Overview
- QE-214 Quality Assurance Plans
- QE-216 Technical Assessment
- QE-217 Audits
- QE-218 Quality Assurance Surveillance Plan
- QE-221 Design Inputs and Reviews
- QE-222 Mistake Proofing Overview
- QE-223 Workmanship Standards Overview
- QE-224 Drawings, Dimensions, and Tolerances Overview
- QE-226 Configuration Management
- QE-227 Functional Configuration Audit/ Physical Configuration Audit
- QE-228 Data Management
- QE-229 Parts Control
- QE-231 Procurement Quality Overview
- QE-232 NASA Letter of Delegation
- QE-241 Manufacturing Processes Overview
- QE-243 Cleanliness and Contamination Control
- QE-244 Control of Foreign Object Debris (FOD)
- QE-245 Packaging, Handling, and Shipping Overview
- QE-246 Material Control
- QE-247 Measurement Systems Analysis Overview
- QE-249 Materials Assurance
- QE-251 Inspection
- QE-252 Inspection Control and Personal Warranty
- QE-253 Testing
- QE-254 Non-Destructive Inspection (NDI) Non-Destructive Evaluation (NDE)
- QE-255 Qualification
- QE-256 Hardware/ Software/ Service Acceptance
- QE-257 Certification of Flight Readiness (COFR) Overview
- QE-263 Material Review Board
- QE-271 Statistical Quality Control Overview
- GRC-115-01 NASA Lean Six Sigma White Belt Training
- HQ-103 MetCal Requirements Overview
- HQ-106 NASA Meteorology and Calibration Program
- HQ-216 8739.6 Self-Paced Workmanship Training

DISCIPLINE ON-THE-JOB TRAINING

- Identify and document lessons learned related to Quality.
- Observe/review either a Material Review Board (MRB), non-conformance report and/or GIDEP Alert/NASA Advisory.
- Observe/support at least two different types of design reviews in support of a technical project or program.
- Provide input or review Quality Management System Command Media (e.g., Configuration Management Procedure, Control of Monitoring and Measuring Equipment, etc.).
- Review at least two Product Quality Assurance Surveillance Plans (PQASPs).
- Review a contract statement of work (quality section) in support of a project or program.
- Review program/project or Center audit, including audit plan, checklist, and audit report.

QUALIFICATION

For more information regarding qualification go to the STEP Qualification Guidelines located on the STEP website.

To qualify at Level 2:
1. Complete STEP Level 1 and all Level 2 core and discipline training outlined by each curriculum.
2. Your supervisor and SMA Technical Discipline Team Lead (TDTL) must approve the qualification package.
LEVEL 3  QUALITY ENGINEERING

LEARNING OUTCOMES

- Use contracting and cost estimating for programs and projects.
- Apply appropriate negotiations and oral and written communication skills.
- Relate intermediate Quality concepts for developing, demonstrating, testing, measuring, and controlling a Quality Management System.
- Analyze Quality tools, design drawings, and technical documentation to identify and support resolution of issues throughout a project lifecycle.
- Use Government Industry Data Exchange Program (GIDEP), Quality monitoring statistics, mistake proofing, and data collection to enhance process improvements.

CORE COURSES*

CORE-ACE  Advocating for and Cost Estimating for SMA Support
CORE-ILT-CC  Crucial Conversations
CORE-NFS  Negotiations for SMA
CORE-NSE  NASA Systems Engineering Overview
SS-0023  Safety & Mission Assurance in the Acquisition Process
SSFT  Building Your Presentation
SSFT  Ensuring Successful Presentation Delivery
SSFT  Improving Your Technical Writing Skills
SSFT  Planning an Effective Presentation

CORE ON-THE-JOB TRAINING*

- Develop a Safety and Mission Assurance Plan (SMAP) for a program/project.
- Develop and lead a case study or lessons learned discussion with your organization, program or project using the Lessons Learned Information System, NASA Mishap Information System or audit data.
- Develop qualification board presentation and conduct a dry run with your TDTL.
- Participate in an activity that requires using the negotiation skills discussed in your coursework.
- Support the development of a cost estimate for a program (Mission Directorate SMA Support or SMA organization).

* You only need to take Core once per level if pursuing multiple disciplines at same level.
DISCIPLINE COURSES

QE-311 Workforce Development, Training and Certification
QE-314 Quality Tools Overview
QE-324 Mistake Proofing
QE-325 Drawings, Dimensions and Tolerances
QE-341 Manufacturing Processes
QE-342 Measurement Uncertainty Analysis
QE-343 Measurement Decision Risk
QE-361 Corrective Action and Problem Reporting Systems
QE-365 GIDEP Overview
QE-371 Cost of Quality
QE-372 Statistical Quality Control
QE-373 Data Collection and Analysis
QE-381 Quality Management Systems
001-07 Introduction to Human Factors in Mishap and Close Call Investigation
HQ-314 Counterfeit Parts Awareness and Inspection – Intermediate
SSFT Designing, Conducting, and Analyzing Experiments in Six Sigma
SSFT Six Sigma Design of Experiments
SSFT Understanding DOE and Planning Experiments in Six Sigma

DISCIPLINE ON-THE-JOB TRAINING

- Develop charts and present Quality position at reviews (e.g., Engineering Review Board, SMA Readiness Review, Flight Readiness Review).
- Participate in a Quality audit as an audit team member.
- Develop a Program/Project Quality Assurance Surveillance Plan (PQASP).
- Conduct or observe at least two separate Quality surveillance activities.
- Participate in one of the following: Material Review Board (MRB), Corrective Action Board (CAB), or develop/assess a non-conformance report, GIDEP Alerts/NASA Advisory.
- Review and assess at least three Purchase Orders from a program/project.
- Participate in or review a component pedigree review package.
- Review (or participate on a team reviewing) a Letter of Delegation (LOD) (Quality section) for Defense Contract Management Agency (DCMA) support of a program/project.
- Develop a contract statement of work (Quality section) in support of a program/project.

QUALIFICATION

For more information regarding qualification go to the STEP Qualification Guidelines located on the STEP website.

To qualify at Level 3:

1. Complete STEP Level 2 in declared discipline and Level 3 core and discipline training outlined by each curriculum.
2. Pass a 60 question Level 3 Comprehensive Exam with a score of at least 70%.
3. Your supervisor and SMA Technical Discipline Team Lead (TDTL) must approve the qualification package.
4. Present to the Level 3 Qualification Board using the NASA Safety Center (NSC) Level 3 Qualification Board Template.
LEARNING OUTCOMES

• Evaluate team dynamics and biases.
• Create a leadership development and mentoring plan.
• Select varying quality tools such as Lean Six Sigma, Design of Experiments, and Corrective Action and Root Cause Analysis for issue identification and problem resolution.
• Interpret the AS9100 Quality Management System standard to become a lead auditor.
• Apply Quality Engineering principles to SMA acquisition procurements.
• Use Quality management tools to interpret and resolve all factors affecting process inputs and outputs.

CORE COURSES*

CORE-LMTD  NASA Leaders Making Tough Decisions
CORE-TDS  Team Dynamics for SMA
Books 24x7  9 Powerful Practices of Really Great Mentors: How to Inspire and Motivate Anyone By: Stephen E. Kohn, Vincent D. O’Connell
SS-212  The Space Shuttle: Thirty Years of Flight, Thirty Years of Lessons Learned
SSFT  Building a Leadership Development Plan
SSFT  Building the Foundation for an Effective Team
SSFT  Developing a Successful Team
SSFT  Encouraging Team Communication

CORE ON-THE-JOB TRAINING*

• Analyze your team’s trust level. Identify ways that you can improve trust in your team.
• Create a personal leadership vision and development plan.
• Develop and deliver a technical presentation, course, webinar, or guest lecture relative to your discipline.
• Identify your personal and team’s unconscious biases.
• Serve as a mentor in your technical discipline for an individual or serve as a group mentor.
• Serve on a Source Evaluation Board as an evaluator or serve as a team member developing the technical requirements for a request for proposals.

* You only need to take Core once per level if pursuing multiple disciplines at same level.
DISCIPLINE COURSES

- QE-411 Quality Tools II
- QE-413 Lean/Six Sigma
- QE-414 Design of Experiments
- QEX-415 AS9100 Lead Auditor Course
- 002-14 NASA Root Cause Analysis
- RM-411 Parts and Materials Assessment (EEE, Mechanical, Parts Stress/Derating)

DISCIPLINE ON-THE-JOB TRAINING

- Serve as a lead auditor on an audit. Develop an audit plan, checklist and audit report.
- Serve as an SMA representative on a procurement team or Source Evaluation Board.
- Participate in a Lean Six Sigma event/activity to improve an existing process or to create a new process.
- Serve as an SMA representative on a Material Review Board in support of a program/project.
- Participate in a failure investigation or significant hardware/software anomaly investigation as the Quality representative for a program/project.
- Develop a Letter of Delegation (LOD) (Quality section) for Defense Contract Management Agency (DCMA) support of a program/project.
- Present Quality’s position at a Safety and Mission Assurance Success Review (SMSR) or at a Mission Flight Readiness Review.

QUALIFICATION

For more information regarding qualification go to the STEP Qualification Guidelines located on the STEP website.

To qualify at Level 4:

1. Complete STEP Level 3 in declared discipline and Level 4 core and discipline training outlined by each curriculum.
2. Your supervisor and SMA Technical Discipline Team Lead (TDTL) must approve the qualification package.
3. Pass a Peer Review Panel (PRP) before scheduling the Level 4 Qualification Board.
4. Present to the Level 4 Qualification Board using the NSC Level 4 Qualification Board Template.