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

<table>
<thead>
<tr>
<th>BUSINESS OF NASA</th>
<th>FOUNDATIONS OF MISSION SUCCESS</th>
<th>PERSONAL EFFECTIVENESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgets, Contracting Principles, Governance Models and Legal, Risk Management, and Decision Analysis</td>
<td>Engineering Principles, Requirements, Root Cause, Mishap Investigation, Corrective Actions, and Lessons Learned</td>
<td>Emotional Intelligence, Influence, Change Management, Leadership, Negotiations, Oral and Written Communications, Self-Awareness, Biases and Team Dynamics</td>
</tr>
</tbody>
</table>

### DISCIPLINE COMPETENCIES

<table>
<thead>
<tr>
<th>RELIABILITY MANAGEMENT</th>
<th>R&amp;M IN ACQUISITION</th>
<th>R&amp;M METHODS IN DESIGN AND DEVELOPMENT</th>
<th>RELIABILITY TESTING AND DEMONSTRATION</th>
<th>USE OF DATABASES AND REPORTS FOR R&amp;M</th>
<th>MATHEMATICAL TOOLS</th>
</tr>
</thead>
</table>

**ENROLL AND FIND OUT MORE INFORMATION**

STEP website: nsc.nasa.gov/STEP

**TECHNICAL DISCIPLINE TEAM LEAD (TDTL)**

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**NASA SAFETY CENTER HELP DESK**

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216.433.9672 (9NSC)
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.
- Identify how the decision making process with design Reliability and Maintainability (R&M) are used to help manage risks.
- Practice how R&M engineering impacts the acquisition decisions.
- Choose design tools and technique usage to enhance systems or equipment R&M.
- Distinguish the importance of R&M impact on the design system or equipment.

CORE COURSES*

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

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.
LEVEL 2

DISCIPLINE COURSES

RM-251  Introduction to Probabilistic Risk Assessment (PRA)
RM-231  Design for Maintainability
RM-241  Reliability, Availability, and Maintainability (RAM) Planning for Programs and Projects
RMX-221  Design for Reliability
002-14  NASA Root Cause Analysis
SS-0009  Basic Fault Tree Analysis I
SS-210  System Safety I
QE-365  GIDEP Overview

DISCIPLINE ON-THE-JOB TRAINING

• Observe a team creating a hazard analysis in support of a project or program.
• Observe/support the development of reliability plan for a specific project.
• Review a Reliability Block Diagram, Maintainability Model, or Availability Model in support of a program or project.
• Under the appropriate supervision, observe/support/review the R&M deliverables in support of a program or project (i.e. Reliability Predictions, RAM Models, RAM Test Plans, FMEA/CIL, Supportability Analysis).

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.
LEARNING OUTCOMES

- Use contracting and cost estimating for programs and projects.
- Apply appropriate negotiations and oral and written communication skills.
- Demonstrate common logic and gate type models for fault tree analysis development.
- Recognize collective analysis data used in distributions, probability, and statistical confidence methods while modeling systems reliability to include FMECA/CIL, RAM, and PRAM.
- Perform an R&M analysis and products for a system, subsystem, or component project support.
- Understand how software and complex electronics can affect R&M development and design, where they are used, and how they are designed.

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

RM-321  Data Collection and Analysis I
RM-331  Reliability, Availability, and Maintainability Modeling I
RM-341  R&M Testing and Demonstration I
RM-351  Maintainability and Supportability Analysis and Integration
RM-361  FMEA/CIL and FMECA
SA-240  Introduction to Software Reliability Engineering
SA-304  Safety of Complex Electronics
SS-0001 Probabilistic Risk Assessment Methods (PRAM) for Practitioners and Managers
SS-0015 Modeling and Simulation in Probabilistic Safety Analysis

DISCIPLINE ON-THE-JOB TRAINING

• Observe a team creating a Probabilistic Risk Assessment (PRA) in support of a project or program.
• Perform an R&M analysis on assigned system/subsystem/component in support of a project or program.
• Perform/support a fault tree analysis on a NASA space subsystem or system in support of a project or program and document the fault tree analysis with all the required content.
• Participate on a team conducting a FMEA/CIL in support of a NASA project or program.
• Serve as a leader/team member creating R&M products and services that are required of your work assignments.
• Serve as a leader/team member to develop a program/project R&M Checklist.
• Serve as a leader/team member to develop a program/project R&M Plan.
• Serve as a team member conducting a Root Cause Analysis.

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.
LEVEL 4

LEARNING OUTCOMES

• Evaluate team dynamics and biases.
• Create a leadership development and mentoring plan.
• Participate in design and project reviews.
• Conduct a FMEA/CIL in support of a NASA project or program including interfacing systems.
• Identify variations, distributions, probability, and statistical confidence methods while modeling Reliability and Maintainability (R&M) design and analysis.
• Develop Safety and Mission Assurance (SMA) R&M analysis and testing techniques to reduce system and lifecycle risk.

CORE COURSES*

<table>
<thead>
<tr>
<th>COURSE</th>
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<tbody>
<tr>
<td>CORE-LMTD</td>
<td>NASA Leaders Making Tough Decisions</td>
</tr>
<tr>
<td>CORE-TDS</td>
<td>Team Dynamics for SMA</td>
</tr>
<tr>
<td>Books 24x7</td>
<td>9 Powerful Practices of Really Great Mentors: How to Inspire and Motivate Anyone By: Stephen E. Kohn, Vincent D. O’Connell</td>
</tr>
<tr>
<td>SS-212</td>
<td>The Space Shuttle: Thirty Years of Flight, Thirty Years of Lessons Learned</td>
</tr>
<tr>
<td>SSFT</td>
<td>Building a Leadership Development Plan</td>
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<td>SSFT</td>
<td>Building the Foundation for an Effective Team</td>
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<td>SSFT</td>
<td>Developing a Successful Team</td>
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<td>SSFT</td>
<td>Encouraging Team Communication and Collaboration</td>
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<td>SSFT</td>
<td>Gauging Your Leadership Performance</td>
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<td>SSFT</td>
<td>Handling Team Conflict</td>
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<td>SSFT</td>
<td>Leading a Cross-functional Team</td>
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<tr>
<td>SSFT</td>
<td>Leading Change</td>
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<tr>
<td>SSFT</td>
<td>Leading Your Team through Change</td>
</tr>
<tr>
<td>SSFT</td>
<td>Overcoming Unconscious Bias in the Workplace</td>
</tr>
<tr>
<td>SSFT</td>
<td>Overcoming Your Own Unconscious Biases</td>
</tr>
<tr>
<td>SSFT</td>
<td>Understanding Unconscious Bias</td>
</tr>
</tbody>
</table>

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

RM-411 Parts and Materials Assessment (EEE, Mechanical, Parts Stress/Derating)
RM-421 Data Collection and Analysis II
RM-431 Reliability, Availability, and Maintainability Modeling II
RM-441 R&M Testing and Demonstration II
RM-451 Physics of Failure
RM-481 Human Reliability Analysis
SA-201 Intermediate Software Assurance
SA-305 Software Failure Modes, Effects, and Criticality Analysis, and Fault Tree Analysis

DISCIPLINE ON-THE-JOB TRAINING

• Review, as a team member or as a lead, the R&M products and services that are required of your work assignments.
• Lead/evaluate the R&M of a product's design at various lifecycle stages using validation, verification, and other review techniques.
• Lead/support a team conducting a FMEA/CIL in support of a NASA project or program.
• Review a quantitative PRA for a NASA space subsystem with the required analytical content.
• Serve as the SMA representative or lead, proactively participating in design reviews and supporting program/project reviews.

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.