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>Software Quality</th>
<th>Software Safety</th>
<th>Software Assurance Planning and Management</th>
<th>Software Assurance Processes and Measurement</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

NASA-NSC-Help@mail.nasa.gov  
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.
- Improve skills to create a Software Assurance plan that includes assuring quality, safety, and reliability throughout the software development lifecycle.
- Utilize Agile Manifesto and Waterfall software improvement techniques to schedule, monitor, test, and program stakeholder software with requirements development.
- Recognize roles and responsibilities to audit and maintain software configuration.
- Identify Software Engineering requirements for various classification of software developed by or for NASA for correctness, validity, and quality.

CORE COURSES*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</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>
</tr>
<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.
DISCIPLINE COURSES

SA-201 Intermediate Software Assurance
SA-202 Introduction to Software Testing
SA-206 Introduction to Software Engineering
SA-306 Software Safety for Practitioners
SA-303 Software Requirements Development and Management
SAI-203 Foundations of Capability, CMMI
SAI-205 Building Development Excellence, CMMI
HQ-105 Introduction to Model-Based Mission Assurance
SSFT Introduction to Agile Software Development

DISCIPLINE ON-THE-JOB TRAINING

- Assist in a review of a project plan.
- Assist in a verification of bi-directional traceability of requirements from at least one phase to the next phase.
- Assist in an assessment of Configuration Management (CM) implementation against the CM plan.
- Classify software on two projects and determine safety criticality according to NPR 7150.2.
- Observe a software change configuration review board meeting.
- Observe a software design review.
- Observe a software peer review or formal inspection.
- Observe a software requirements review.
- Observe an assurance of testing activities at any level.
- Observe documenting, tracking, and closure of non-conformances.
- Observe planning for and execution of a Software Assurance audit.
- Observe Software Assurance activities related to a hazard analysis.
- Observe Software Assurance activities related to a software safety review meeting.

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 software testing applications and inspections during all phases of development to communicate associated risk.
• Understand the Capability Maturing Model Integration (CMMI) framework.
• Select intermediate test mechanisms such as: white/black box, model based, functional, stress, and regression a part of a verification and validation strategy.
• Recognize complex electronics to mitigate safety risks with FMECA/CIL and fault tree analysis.

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.
SOFTWARE ASSURANCE

LEVEL 3

DISCIPLINE COURSES

- SA-301 Intermediate Software Testing
- SA-302 Introduction and Assurance of Complex Electronics
- SA-305 Software FMECA and FTA
- SA-402 Software and Process Metrics
- SAI-302 Advancing Organizational Capability: Applying CMMI
- SAI-304 High Maturity Concepts, CMMI
- SSFT Agile Project Scheduling and Monitoring
- SSFT Agile Stakeholder Engagement and Team Development

DISCIPLINE ON-THE-JOB TRAINING

- Evaluate project plans.
- Participate in a Change Control Board (CCB) meeting.
- Participate in a formal acceptance activity.
- Participate in a peer review or formal inspection.
- Participate in a Software Assurance audit.
- Participate in assuring software risks are managed.
- Participate in Capability Maturity Model Integration (CMMI) appraisal activities.
- Participate in the assurance of testing activities.
- Participate in the collection and assessment of lessons learned.
- Participate in the collection of Software Assurance metrics data for a 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.
• Compile technical safety requirements to implement design features for safer software.
• Assess methods for prevention and probabilistic risk assessment in decision making, quantitative analysis, and safety rationale.
• Apply scientific and engineering principles to critical software intensive systems and acquisition processes.
• Examine metric data to improve Software Assurance processes.

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 and Collaboration
SSFT  Gauging Your Leadership Performance
SSFT  Handling Team Conflict
SSFT  Leading a Cross-functional Team
SSFT  Leading Change
SSFT  Leading Your Team through Change
SSFT  Overcoming Unconscious Bias in the Workplace
SSFT  Overcoming Your Own Unconscious Biases
SSFT  Understanding Unconscious Bias

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**

- SA-205  Formal Inspection: A Perspective - Based Approach
- SA-431  Software Safety Planning and Management
- SAI-403  Software Engineering Management
- SS-0001  Probabilistic Risk Assessment Methods (PRAM) for Practitioners and Managers

**DISCIPLINE ON-THE-JOB TRAINING**

- Assess and track a project's implementation of a Software Assurance Plan.
- Lead a discussion on software quality, safety, security, and/or reliability.
- Lead the Software Assurance effort for a small project or an element of a larger project.
- Participate in a software acceptance review.
- Represent Software Assurance on a review panel.

**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.