COURSE SYLLABUS

SL 3

USAREUR-AF

COURSE SYLLABUS — SL 3: ADVANCED BUILDER

Maven Smart System (MSS) — USAREUR-AF

HEADQUARTERS
UNITED STATES ARMY EUROPE AND AFRICA
(USAREUR-AF)
Wiesbaden, Germany

26 MARCH 2026

DRAFT — UNOFFICIAL — NOT FOR OPERATIONAL USE

COURSE SYLLABUS — SL 3: ADVANCED BUILDER

MAVEN SMART SYSTEM (MSS) — USAREUR-AF

Field	Detail
Level	SL 3 (Advanced Builder — data-adjacent specialists)
Duration	5 days (40 hours)
Prerequisite	SL 1 and SL 2 complete (both Go evaluations on file)
Audience	17/25-series signal soldiers, S6/G6 staff, G2 intelligence analysts, operational data analysts
Format	Instructor-led lab + design workshop + practical exercise
Location	MSS Training Environment

BLUF: SL 3 moves you from building components to designing systems. After this course you can architect an Ontology model from a mission requirement, build multi-source pipelines with scheduled refresh, produce multi-page Workshop applications with conditional logic, conduct advanced analysis in Contour and Quiver, and own the full C2DAO governance cycle. SL 3 personnel are the data leads of their formation.

LEARNING OBJECTIVES

#	Objective
1	Build a multi-page Workshop application with conditional logic (show/hide, branching), variable passing between pages, and URL-based deep linking
2	Build a Pipeline Builder pipeline with multi-source joins, union transforms, group-by aggregations, and computed columns derived from multiple sources
3	Design an Ontology schema (Object Types, Link Types, Actions) from a mission requirement — documented and reviewed against the SL 3 design rubric
4	Configure a scheduled pipeline with email alerting on build failure

#	Objective
5	Conduct advanced Contour analysis: pivot tables, calculated columns, parameter controls, saved analysis views
6	Build a multi-object Quiver dashboard with linked views and cross-object filter propagation
7	Configure (not author) an AIP Logic workflow — connect inputs, outputs, trigger conditions, and interpret lineage graphs. **Scope note:** SL 3 covers UI-based configuration of existing AIP Logic workflows only. Authoring AI models, writing prompts, or creating new Agent Studio workflows requires SL 4H (AI Engineer).
8	Execute the full C2DAO promotion workflow from branch creation through data steward approval, including responding to steward feedback

PRE-COURSE CHECKLIST

Complete **7+ duty days before Day 1:**

- ☐ Confirm both SL 1 and SL 2 Go evaluations are on file with your unit training coordinator
- ☐ Request **Editor access** in the MSS Training Environment from your unit MSS Administrator
- ☐ Request AIP Logic **configuration access** — may require C2DAO coordination; required for Day 4; confirm active before Day 1
- ☐ Read TM-30, Chapter 1 (Introduction) and complete the prerequisite self-check — 30 min
- ☐ Review TM-20, Chapter 5 (Workshop) — if you cannot independently build a Workshop application with a table, filter, and Action button, resolve that gap before arriving

DAILY SCHEDULE

Day 1 — Advanced Workshop

Time	Block	Method	Content
0800–0830	—	Brief	SL 3 overview; what you will build by Day 5; design-first methodology
0830–1030	1	Lab	Multi-page Workshop: page navigation, parameter configuration, URL deep links

Time	Block	Method	Content
1030–1045	—	Break	
1045–1200	2	Lab	Conditional logic: show/hide panels, conditional formatting on tables, dynamic widget visibility rules
1200–1300	—	Lunch	
1300–1500	3	Lab	Variable passing: passing object selections between pages; filtered detail views driven by page-1 selection
1500–1515	—	Break	
1515–1700	4	Lab	Design exercise: build a 3-page operations dashboard (portfolio → unit detail → historical trend); instructor critique

Evening reading: TM-30, Chapter 3 (Advanced Pipeline Builder — join and aggregation sections).

Supplemental self-study (optional, after evening reading): Palantir Developers — *Workshop* | *Creating What If Analyses with Scenarios*, *Workshop* | *Saving your What If Analyses*, *Workshop* | *Loading and Applying Scenarios*, *Workshop* | *How to Preload States in Foundry Workshop Applications*. These four videos cover the Workshop Scenarios feature (what-if analysis and preloaded state) not covered in the Day 1 lab blocks. Instructors with slack time may incorporate one during the Day 1 afternoon design exercise.

Day 2 — Advanced Pipeline Builder

Time	Block	Method	Content
0800–0830	—	Review	Day 1 questions; Workshop design critique debrief
0830–1030	5	Lab	Multi-source joins: inner/left/outer, handling fan-out after join, post-join deduplication patterns
1030–1045	—	Break	
1045–1200	6	Lab	Union transforms: combining datasets with compatible schemas, handling schema mismatches
1200–1300	—	Lunch	

Time	Block	Method	Content
1300–1500	7	Lab	Group-by aggregations: count, sum, min/max, computed aggregation columns; aggregate-then-join patterns
1500–1515	—	Break	
1515–1630	8	Lab	Output configuration: overwrite vs. append mode; append mode for snapshot pipelines and historical records
1630–1700	9	Lab	Scheduled pipeline configuration: schedule expression, build failure email alert setup

Evening reading: TM-30, Chapter 4 (Ontology Design — domain analysis and Object Type design methodology). Read before Day 3.

Day 3 — Ontology Design

Time	Block	Method	Content
0800–0900	—	Review	Day 2 questions; common pipeline errors from the lab
0900–1000	10	Lecture	Ontology design methodology: domain analysis, entity identification, relationship mapping, Action design
1000–1015	—	Break	
1015–1115	11a	Lab	Individual design exercise: translate a provided mission requirement to a documented Ontology schema (Object Types, Link Types, cardinality, Actions) — solo, no instructor guidance
1115–1130	11b	Peer check	Structured peer review: each trainee exchanges draft schema with a partner; partner scores against the 6-item rubric; identify any zero-score item and flag to instructor before proceeding. Trainees with a flagged zero-score item revise before Block 12
1130–1200	11c	Lab	Revise and finalize schema based on peer feedback; annotate cardinality and property type choices in writing — these annotations are presented in Block 12
1200–1300	—	Lunch	
1300–1500	12	Workshop	Design critique: each trainee presents schema; class critiques against the 6-item design rubric; instructor facilitates

Time	Block	Method	Content
1500–1515	—	Break	
1515–1700	13	Lab	Build the approved design: create the Ontology from the Day 3 design exercise; connect pipeline output via Ontology write step

Evening reading: TM-30, Chapter 2 (conditional logic review); TM-30, Chapter 4 (re-read design rubric in detail before Day 4).

Day 4 — Analytics Tools and AIP Logic

Time	Block	Method	Content
0800–0830	—	Review	Day 3 questions; common Ontology build errors
0830–1030	14	Lab	Contour: pivot tables, calculated columns, parameter controls, workbook structure, saving and sharing analysis views
1030–1045	—	Break	
1045–1200	15	Lab	Quiver: multi-object analysis, linked views, cross-filter propagation, drilling between Object Types
1200–1300	—	Lunch	
1300–1430	16	Lab	AIP Logic configuration: connecting triggers, inputs, outputs; human review queue design
1430–1445	—	Break	
1445–1600	17	Lab	Data lineage diagnostic inject: trainees receive a provided pipeline with a deliberate silent fault (a type mismatch 3 transforms upstream causing a 0-row output). Using only the lineage graph — no error messages — trainees must: (1) trace the lineage to the source of the fault, (2) identify the transform where the

Time	Block	Method	Content
			type mismatch occurs, and (3) document the fix in writing before opening the transform node. Evaluator confirms diagnosis is correct before trainee clicks.
1600 – 1700	18	Discuss	C2DAO production standards: what constitutes a production-ready data product; quality gates

Evening reading: TM-30, Chapters 5–7 (Contour and Quiver, AIP Logic, Governance) — review what you covered; read governance chapter fully before Day 5.

Day 5 — Governance and Practical Exercise

Time	Block	Method	Content
0800–0900	19	Lab	Full C2DAO promotion workflow: branch → change → description → submit → respond to feedback → approval
0900–1000	20	Review	Full-stack review: trace raw source → pipeline → Ontology → Workshop → governance; identify production-readiness gaps
1000–1015	—	Break	
1015–1100	21	Brief	Practical exercise scenario brief; **design planning time** — document Ontology schema on paper before touching the platform. Design document submitted to evaluator before build phase begins.
1100–1130	—	**Design review**	Evaluator reviews Ontology design against 6-item rubric (see Design Rubric section below). Trainees with fatal design flaws correct before proceeding. Clock does not start until design is approved.
1130–1200	—	Buffer	Open lab — resolve any tool access or environment issues; evaluator available for clarifying questions (no design guidance)
1200–1300	—	Lunch	
1300–1700	22	**Eval**	**Practical exercise (evaluated)** — build phase begins after lunch; design document already approved

---

REQUIRED READING SUMMARY

When	Reading
Before Day 1	TM-30, Ch 1 + prerequisite self-check
Before Day 1	TM-20, Ch 5 (Workshop) — prerequisite review
Day 1 evening	TM-30, Ch 3 (Pipeline — joins and aggregations)
Day 2 evening	TM-30, Ch 4 (Ontology Design — methodology and rubric)
Day 3 evening	TM-30, Ch 2 (conditional logic review); TM-30, Ch 4 (rubric detail)
Day 4 evening	TM-30, Chs 5–7 (Contour, Quiver, Governance)

PRACTICAL EXERCISE

Scenario: The S3 requires a multi-source readiness dashboard combining personnel and equipment data, with a battalion-level portfolio view and drill-down to unit detail.

#	Task
1	Design and document an Ontology schema: `Unit` and `ReadinessReport` Object Types, Link Type, and `UpdateStatus` Action — evaluated against design rubric before build begins
2	Build a Pipeline Builder pipeline joining two provided datasets on `unit_id`; compute an overall readiness score per unit as a calculated column
3	Configure pipeline output in Append mode; run it twice; verify two distinct snapshot records
4	Build a multi-page Workshop application: Page 1 portfolio view (all units, status summary, conditional formatting); Page 2 unit detail linked from Page 1 via object selection
5	Build a Quiver dashboard with linked views: an Object selector (battalion) connected to a bar chart that filters by selection; confirm filter propagation by selecting a battalion and verifying the chart updates to display only that battalion's readiness data
6	Submit pipeline and application through the C2DAO promotion workflow with a complete change description; respond to one round of evaluator feedback

Evaluator criteria for Ontology design: Reviewed against the 6-item design rubric. Go requires ≥75% score with no zero-score item.

Go standard: All 6 tasks completed. Pipeline produces correct output with two verifiable snapshot records. Workshop navigation and conditional logic validated. Quiver linked-view filter propagation demonstrated (selecting a battalion filters the linked bar chart). Promotion request includes complete description and trainee responded to steward feedback.

NOTE

Contour proficiency — Contour analysis (LO 5) is assessed through instructor observation during the Day 4 lab (Blocks 14–15). It is not a separate evaluated task in the practical exercise. Trainees who did not demonstrate Contour proficiency during Day 4 should complete the Contour self-study in TM-30, Chapter 5 before rescheduling.

ONTOLOGY DESIGN RUBRIC — 6-ITEM EVALUATION CRITERIA

The design document submitted on Day 5 is evaluated against the following six items before build begins. Each item is scored 0 (fail), 1 (partial), or 2 (full). Go requires ≥9/12 with no zero-score item.

#	Criterion	Score 0	Score 1	Score 2
1	**Entity identification** — Object Types match the domain entities in the mission requirement	Object Types are wrong or missing entirely	Object Types identified but conflated or over-scoped	Object Types correctly and minimally represent domain entities
2	**Relationship mapping** — Link Types reflect real relationships; cardinality is correct	No Link Types defined, or Link Types between wrong Object Types	Link Types identified but cardinality wrong (e.g., many-to-many where one-to-many is correct)	Link Types correct; cardinality correct; direction documented
3	**Property type correctness** — Each property has the correct Foundry type	Multiple type errors (strings for dates, etc.)	One type error that would not block downstream analytics	All property types correct; no type-as-string workarounds
4	**Primary Key selection** — PK uniquely identifies each object; natural or synthetic key is appropriate	No PK defined, or PK is non-unique	PK defined but is fragile (composite, user-entered, or non-stable)	PK is stable, unique, and sourced from a reliable field
5	**Action scope** — Actions are narrowly scoped; write rules touch only required properties	Actions write to properties outside stated requirements	Action scope is too broad but not harmful	Actions narrowly scoped; parameter types appropriate;

#	Criterion	Score 0	Score 1	Score 2
				access restriction defined
6	**Naming convention compliance** — Object Types, properties, and pipelines follow C2DAO naming standards	Multiple naming violations	One naming violation	Full compliance with USAREUR-AF C2DAO naming standards

GO CRITERIA

Your design document is reviewed before you build — a fatally-flawed schema must be corrected before the build phase starts. The promotion workflow requires defending design choices. "The instructor said to" is not an acceptable answer. Be prepared to explain cardinality choices, property types, and Action scope.

NO-GO REMEDIATION

Outcome	Action
No-Go — design rubric score below threshold or zero-score item	Redesign required. Review TM-30, Chapter 4 (Ontology design methodology). Re-evaluation scheduled through unit training coordinator; full Day 5 re-run required.
No-Go — pipeline produces incorrect output	Review TM-30, Chapter 3 (multi-source joins and append mode). Re-evaluation required.
No-Go — Workshop navigation or conditional logic fails	Review TM-30, Chapter 2 (advanced Workshop). Re-evaluation required.
No-Go — Quiver linked views not configured	Review TM-30, Chapter 5 (Quiver linked views). This is the most common single-task failure — complete the Quiver self-study exercise in SL 3 before rescheduling.
No-Go — promotion description incomplete	Review TM-30, Chapter 7. Same-day retry authorized at evaluator discretion for this item only.

Re-evaluation requires full repetition of the practical exercise (all tasks), not just the failed tasks. Schedule through unit training coordinator. SL 3 qualification cannot be self-certified.

KEY TIPS

Risk	Guidance
Ontology design	Spend 20 min on paper first: entities, relationships, what users need to do — then open Ontology Manager. Design-first trainees build faster and build it right
Multi-source joins	Both datasets must be in the same Foundry project or cross-project referenced. A join on inaccessible data silently returns 0 rows. Check row counts after every join
Append mode	Configure Append mode **before** the first run. Running once in Overwrite then switching gives you 3 records after two Append runs, not 2
Contour pivot tables	Different from Excel — read TM-30, Section 5-2 before the Contour lab
Quiver linked views	**Most common practical exercise No-Go.** Filter links must be explicitly configured — selecting an object does NOT automatically filter another view. Complete the Quiver self-study in TM-30, Chapter 5 the evening before Day 5. Do not skip this.
AIP Logic scope	SL 3 covers configuration only — connecting triggers, inputs, outputs on existing workflows. If the scenario asks you to author a new AI model or write prompts, that is out of scope. Raise it immediately rather than attempting it.
Promotion description	"Updated Workshop application" fails. "Changed unit filter to include inactive units per S3 requirement dated 10MAR26" passes

CONTINUATION

SL 3 is the gateway to **all** SL 4 tracks — both WFF (SL 4A–F) and Specialist (SL 4G–O). SL 3 completion is a **hard prerequisite — no waivers** — for every track in the SL 4 series.

WFF Tracks (SL 4A–F) — prereq: SL 3 (required):

Track	WFF	Audience
SL 4A	Intelligence	G2/S2 staff, targeting officers, all-source analysts
SL 4B	Fires	FSOs, FSEs, targeting officers, fires NCOs
SL 4C	Movement & Maneuver	G3/S3 staff, operations officers, maneuver planners

Track	WFF	Audience
SL 4D	Sustainment	G4/S4 staff, logistics officers, supply chain managers
SL 4E	Protection	FP officers, CBRN officers, provost marshal staff
SL 4F	Mission Command	Battle captains, XOs, CDRs, MC-function staff

Specialist Tracks (SL 4G–O) — prereq: SL 3 (required):

Track	Specialist Role	Advanced Level
SL 4G	ORSA	SL 5G (Advanced ORSA)
SL 4H	AI Engineer	SL 5H (Advanced AI Engineer)
SL 4M	ML Engineer	SL 5M (Advanced ML Engineer)
SL 4J	Program Manager	SL 5J (Advanced Program Manager)
SL 4K	Knowledge Manager	SL 5K (Advanced Knowledge Manager)
SL 4L	Software Engineer	SL 5L (Advanced Software Engineer)
SL 4N	UX Designer	SL 5N (Advanced UX Designer)
SL 4O	Platform Engineer	SL 5O (Advanced Platform Engineer)

T3-I (Instructor Certification) — parallel path: SL 3 graduates who demonstrate strong instructional aptitude may be nominated for T3-I (Instructor Certification). T3-I is a 5-day course that qualifies graduates to deliver SL 1, SL 2, and SL 3 as certified instructors. See SYLLABUS_T3I for details.

TM-50A–F do not exist. The advanced series is SL 5G–O only. Any reference to TM-50A through TM-50F is stale and incorrect.

USAREUR-AF Operational Data Team Syllabus SL 3 | Version 2.0 | March 2026