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to improve the quality of life.*

KITE INTERNATIONAL APPLIED TECHNOLOGY TRAINING PROGRAM

Applied Quantum Logistics Weekly Course Outline

Level 1 Foundation + Level 2 Advanced

Python - Jupyter - Qiskit-based workflows - Sanitized logistics datasets

Weekly Course Outline

KITE Applied Quantum Logistics Training Program | Level 1 Foundation and Level 2 Advanced

Document Purpose

This PDF is a school- and university-facing weekly course outline. It shows the program narrative, delivery formats, student deliverables, standard lesson structure, detailed Level 1 weekly map, detailed Level 2 weekly map, accelerated formats, intro workshop options, and real department application.

Program Narrative

KITE enrolls students into its **Applied Quantum Logistics Training Program**, a structured technical training program focused on logistics data, decision modeling, classical baseline workflows, and Qiskit-based workflow execution.

KITE does not teach Qiskit as a standalone certification course. Qiskit already has its own learning ecosystem. KITE teaches students how to apply **Python, Jupyter notebooks, Qiskit-based workflows, and sanitized logistics datasets** inside structured logistics and optimization scenarios.

Core Pathway

data review -> decision framing -> baseline execution -> Qiskit-based workflow execution -> comparison -> technical explanation

Program Versions

Program Version	Length	Best Fit
Standard Program	8 weeks per level	Schools, universities, formal cohorts, and mixed-experience students.
Accelerated Program	4 weeks per level	Advanced students or students with coding/Jupyter experience.
Intro Workshop	1 session or 1 week	Shows the university what the program teaches before a full cohort commitment.

Student Deliverables

Each student should produce evidence of learning through:

Deliverable	Purpose
Scenario worksheet	Shows the student can identify the objective, variables, constraints, and scoring logic.
Baseline result	Shows the student can run and interpret the classical comparison point.
Qiskit-based workflow result	Shows the student can execute the prepared workflow notebook and record the output.
Comparison explanation	Shows the student can compare outputs and explain whether results match or differ.
Short technical report	Shows the student can communicate findings professionally.
Final presentation or reflection	Shows the student can explain the full workflow and summarize readiness for the next level.

Standard Lesson Format

- 1 Concept lesson
- 2 Instructor case example
- 3 Student try-it problem
- 4 Step-by-step answer review
- 5 Dataset / CSV bridge
- 6 Baseline notebook run
- 7 Qiskit-based workflow run
- 8 Result comparison
- 9 Technical explanation
- 10 Homework or reflection

Instructional Rule

The hand example introduces the idea. The core training value comes from connecting the idea to the dataset, baseline workflow, Qiskit-based workflow, comparison, and technical explanation.

Level 1 Foundation - Single-System / Controlled Logistics Training

Level 1 teaches students how to work through controlled logistics decision problems using clean, sanitized datasets and structured notebooks.

Level 1 Base Workflow

read the data -> understand the scenario -> identify variables and constraints -> run the baseline -> execute Qiskit-based workflow -> compare outputs -> explain the result

Level 1 scenarios:

Scenario	Purpose
Scenario 01 - Prioritize	Students learn how to choose the strongest legal actions when not everything can be selected.
Scenario 02 - Allocate	Students learn how to assign limited resources across available options.
Scenario 03 - Relocate	Students learn how to compare location, movement, or placement decisions.

Level 1 Standard Course Map - 8 Weeks

Week 1 - Program Orientation + Technical Setup

Main focus: Students understand what the program is and prepare their tools.

Students learn	- what applied quantum logistics means - how KITE uses Qiskit-based workflows, not standalone Qiskit instruction - how the course folders are organized - how to open Python, VS Code, Jupyter, and notebooks - how sanitized datasets protect real data while preserving training value
Class activity	- open course folder - open first notebook - confirm dataset file is available - run a basic notebook test cell
Student deliverable	- setup confirmation - first notebook run screenshot or note

Week 2 - Notebook Operation + Dataset Reading

Main focus: Students learn how to operate notebooks and read logistics data.

Students learn	- how to run notebook cells in order - how to reset and rerun notebooks - how to read comments and outputs - how to locate scenario input files - how to read rows, scores, categories, and constraints
Class activity	- open sample CSV - identify decision rows - identify score column - identify constraint/rule column - run notebook section that reads the input file
Student deliverable	dataset review worksheet

Week 3 - Scenario 01: Prioritize

Main focus: Students learn how prioritization works. A logistics team cannot handle every action at once, so it must decide what should be handled first under rules and limits.

Students learn	• decision variable • constraint • score • feasibility • objective • legal vs. illegal choices
Class activity	• solve a small hand example • solve a student try-it case • open Scenario 01 input CSV • identify decision rows and priority scores • run baseline section
Student deliverable	• Scenario 01 worksheet • baseline selected decisions • baseline score • feasibility check

Week 4 - Scenario 01: Qiskit-Based Workflow + Comparison

Main focus: Students complete the full Scenario 01 workflow.

Students learn	• how the Qiskit-based workflow fits after the baseline • how to inspect selected decisions • how to compare baseline and Qiskit-based outputs • how to explain prioritization in professional language
Class activity	• run Scenario 01 Qiskit-based workflow • record selected decisions • compare with baseline • write short result explanation
Student deliverable	• Qiskit-based workflow result • comparison explanation • short Scenario 01 technical summary

Week 5 - Scenario 02: Allocate

Main focus: Students learn how allocation works when resources are limited. A department may have limited staff, inventory, time, budget, or processing capacity. Allocation decides where limited resources should go.

Students learn	• limited resource logic • capacity constraint • assignment decision • tradeoff between choices • why the highest score alone may not be enough
Class activity	• solve small allocation example • review Scenario 02 input CSV • identify resource limit • run baseline allocation workflow
Student deliverable	• Scenario 02 worksheet • baseline allocation result • resource feasibility check

Week 6 - Scenario 02: Qiskit-Based Workflow + Allocation Report

Main focus: Students compare classical and Qiskit-based allocation outputs.

Students learn	• how allocation outputs are reviewed • how to check if resources were overused • how to explain why certain options were selected • how to write a technical allocation note
Class activity	• run Scenario 02 Qiskit-based workflow • compare baseline and Qiskit-based result • identify match/difference • write allocation explanation
Student deliverable	• Qiskit-based allocation result • comparison explanation • short allocation report

Week 7 - Scenario 03: Relocate

Main focus: Students learn how relocation or movement decisions are structured. A logistics team may need to compare whether an item, resource, or operational focus should remain in one place or shift to another.

Students learn	• location-based decision-making • movement cost • benefit vs. penalty • source and destination logic • location feasibility • tradeoff analysis
Class activity	• solve simple relocation example • review Scenario 03 input CSV • identify location options • identify movement rule or cost • run baseline relocation workflow
Student deliverable	• Scenario 03 worksheet • baseline relocation result • feasibility explanation

Week 8 - Scenario 03 Qiskit-Based Workflow + Level 2 Introduction

Main focus: Students complete Level 1 and preview Level 2.

Students learn	• how to run the Scenario 03 Qiskit-based workflow • how to compare relocation outputs • how to explain the full Level 1 workflow • how Level 2 expands the problem size and realism
Class activity	• run Scenario 03 Qiskit-based workflow • compare baseline and Qiskit-based outputs • complete final Level 1 reflection • receive Level 2 pathway overview
Student deliverable	• final Level 1 reflection or presentation • completed comparison notes • Level 2 readiness summary

Level 1 End Goal

By the end of Level 1, students should be able to open a structured Python/Jupyter notebook, understand the logistics decision problem, run the baseline, execute the Qiskit-based workflow, compare outputs, and explain the results professionally.

Level 2 Advanced - Department-Style Logistics Training

Level 2 takes the same core workflow from Level 1 and makes it more realistic. Students move from controlled scenarios into larger, more department-style problems.

Level 2 increases complexity through:

- more data rows
- more locations
- more constraints
- more demand signals
- more tradeoffs
- stronger reporting expectations

Level 2 scenarios:

Scenario	Purpose
Scenario B1 - Advanced Prioritize	Students prioritize actions using multiple scoring signals, urgency, demand, and constraints.
Scenario B2 - Advanced Allocate	Students allocate limited resources across a larger set of options, locations, or categories.
Scenario B3 - Advanced Relocate	Students compare movement/location decisions across a broader network.

Level 2 Standard Course Map - 8 Weeks

Week 1 - Level 2 Orientation + Advanced Dataset Review

Main focus: Students transition from training examples to department-style data.

Students learn	• how Level 2 differs from Level 1 • how larger datasets change the workflow • how demand signals can affect logistics decisions • how to read multi-location or multi-category inputs • how to preserve the same workflow discipline from Level 1
Class activity	• review advanced scenario structure • inspect larger inputs • identify demand/location/category fields • review Level 1 workflow expectations
Student deliverable	• advanced dataset review worksheet

Week 2 - Scenario B1: Advanced Prioritize

Main focus: Students prioritize using more than one score. Real department question: which items, locations, issues, or opportunities should the department focus on first?

Students learn	• demand score • urgency score • availability score • risk or penalty score • combined priority score • constraint-based selection
Class activity	• review B1 input CSV • identify scoring signals • define objective • run baseline prioritization workflow
Student deliverable	• B1 scenario worksheet • baseline result • priority logic explanation

Week 3 - Scenario B1 Qiskit-Based Workflow + Technical Memo

Main focus: Students compare advanced prioritization outputs.

Students learn	• how to compare multi-score results • how to explain why an option ranked highly • how to detect if Qiskit-based output matches or differs from baseline • how to write a department-style technical memo
Class activity	• run B1 Qiskit-based workflow • compare multi-score output • identify match/difference • draft technical memo
Student deliverable	• Qiskit-based B1 result • comparison explanation • short technical memo

Week 4 - Scenario B2: Advanced Allocate

Main focus: Students allocate limited resources across a larger system. Real department question: how should limited attention, staff, monitoring time, or operational resources be assigned?

Students learn	• resource capacity • competing demand groups • allocation limits • fairness or coverage rules • feasibility under multiple constraints
Class activity	• review B2 input CSV • identify resource limits • define allocation objective • run baseline allocation workflow
Student deliverable	• B2 scenario worksheet • baseline allocation result • feasibility explanation

Week 5 - Scenario B2 Qiskit-Based Workflow + Allocation Analysis

Main focus: Students compare advanced allocation results.

Students learn	• how to check resource usage • how to explain allocation tradeoffs • how to compare outputs under capacity rules • how to recommend a valid allocation decision
Class activity	• run B2 Qiskit-based workflow • compare allocation output • review resource usage • draft allocation analysis
Student deliverable	• Qiskit-based B2 result • comparison explanation • allocation analysis memo

Week 6 - Scenario B3: Advanced Relocate

Main focus: Students work with movement/location tradeoffs. Real department question: should attention, inventory, reporting, or operational focus shift from one place to another?

Students learn	• origin/destination logic • movement cost • opportunity gain • location constraint • penalty and benefit tradeoff • network-style comparison
Class activity	• review B3 input CSV • identify movement options • define relocation objective • run baseline relocation workflow
Student deliverable	• B3 scenario worksheet • baseline relocation result • tradeoff explanation

Week 7 - Scenario B3 Qiskit-Based Workflow + Department Recommendation

Main focus: Students turn outputs into a recommendation.

Students learn	• how to compare relocation outputs • how to identify strongest feasible movement decision • how to explain tradeoffs clearly • how to write a recommendation from model output
Class activity	• run B3 Qiskit-based workflow • compare relocation output • select recommendation logic • draft department-style recommendation
Student deliverable	• Qiskit-based B3 result • comparison explanation • department-style recommendation memo

Week 8 - Level 2 Capstone + Internship/Project Readiness

Main focus: Students demonstrate they can complete the full applied workflow.

Students learn	• selected scenario review • baseline result • Qiskit-based workflow result • comparison explanation • short technical report • final presentation/reflection
Class activity	• select or review a scenario • run/confirm baseline and Qiskit-based outputs • prepare capstone explanation • complete readiness review
Student deliverable	• Level 2 capstone report • final presentation/reflection • internship/project readiness review

Level 2 End Goal

By the end of Level 2, students should be able to work through a larger department-style scenario, interpret more complex inputs, run the required workflows, compare outputs, write a technical memo, and present a practical recommendation.

Accelerated Program Map

The accelerated program uses the same logic but compresses the schedule for stronger students or students with coding/Jupyter experience.

Level 1 Accelerated - 4 Weeks	Focus
Week 1	Setup, notebook operation, dataset review, Scenario 01 intro.
Week 2	Scenario 01 full workflow + Scenario 02 intro.
Week 3	Scenario 02 full workflow + Scenario 03 intro.
Week 4	Scenario 03 full workflow, final report, Level 2 preview.

Level 2 Accelerated - 4 Weeks	Focus
Week 1	Advanced dataset review + Scenario B1.
Week 2	Scenario B2 advanced allocation.
Week 3	Scenario B3 advanced relocation.
Week 4	Capstone report, final presentation, project readiness review.

Intro Workshop Map

Option	Length	Purpose / Structure
Option A - One Session Workshop	60-90 minutes	Program overview; applied quantum logistics meaning; simple prioritization example; sanitized dataset demonstration; baseline notebook output; Qiskit-based workflow output; comparison explanation; review of Level 1 and Level 2 pathway.
Option B - One Week Workshop	5 days	Day 1: program overview + setup. Day 2: Scenario 01 hand example + dataset review. Day 3: baseline workflow run. Day 4: Qiskit-based workflow run. Day 5: comparison explanation + final reflection.

Real Department Application

The value of the program is that students learn the same thinking pattern a department would use, but in a controlled training format. The student version is simplified; the real department version uses more specific objectives, more complex constraints, and stronger data signals.

Department Question	Related Training Skill
Which logistics issue should be prioritized first?	Scenario 01 / B1: Prioritize.
Which location has the strongest opportunity signal?	Scenario B1: Advanced Prioritize.
Which batch, item, or category needs attention?	Prioritize using demand, availability, urgency, and risk signals.
Where should limited monitoring resources be allocated?	Scenario 02 / B2: Allocate.
Which data source or operational issue should be reviewed first?	Scenario 01 / B1: Prioritize.
Should attention shift from one location/category to another?	Scenario 03 / B3: Relocate.
How do classical and Qiskit-based workflow outputs compare?	All scenarios.

Department Pattern

define the problem -> apply constraints -> run workflows -> compare outputs -> explain the decision

Course Docket Summary

Level	Scenarios	Goal
Level 1 Foundation	Scenario 01: Prioritize; Scenario 02: Allocate; Scenario 03: Relocate.	Teach the workflow in a controlled setting.
Level 2 Advanced	Scenario B1: Advanced Prioritize; Scenario B2: Advanced Allocate; Scenario B3: Advanced Relocate.	Prepare students for department-style technical analysis.

Required Evidence of Learning

- scenario worksheet
- baseline result
- Qiskit-based workflow result
- comparison explanation
- short technical report
- final presentation or reflection

Final Positioning

KITE does not teach Qiskit as a standalone subject. KITE teaches students how to apply Qiskit-based workflows inside structured logistics and optimization problems using Python, Jupyter, and sanitized logistics datasets.