Module Plan
Robotics Path Finder

Explorer Track – Coding Café

November 2025

1 Planning Philosophy

The project is divided into focused modules so that parallel work remains possible and integration risk stays low. Each module owns clear inputs, outputs, and validation criteria.

2 Module Breakdown

Module	**Scope**	**Primary Owner**	**Status**
Area Selection	Curate LiDAR tile IDs, maintain AOI catalogue, store acquisition metadata.	Mudith Daga	Planned
Data Acquisition	Automate downloads, checksum verification, and caching of LAS/LAZ files.	Tavish Mankash	Planned
Preprocessing Pipeline	Convert point clouds to rasters, generate DEM/DSM layers, and clean noise.	Keshava Prasad	Planned
Cost Map Builder	Fuse rasters into traversability grid, encode constraints, expose config knobs.	Prakamya Joshi	Planned
Path Planner Core	Implement baseline A* search, path validation checks, and logging.	Tanvir Sandhu	Planned
Visual Analytics	Provide notebooks/plots for sanity checks and mentor updates.	Shared	Planned
Integration Testing	Define regression tests, sample scenarios, and performance benchmarks.	Shared	Planned
Documentation	Maintain design notes, READMEs, and sprint updates.	Shared	Planned

3 Milestones

- **Week 2**: Data acquisition scripts operational with two sample tiles processed end-to-end.

- **Week 3**: Baseline cost map generator producing grids that feed into planning stub.
- **Week 4**: Path planner returning candidate routes with basic visual validation plots.
- **Week 5**: Integration tests and stress runs on expanded tile set; iterate on heuristics.
- **Week 6**: Final polish, documentation, and optional stretch goals (real-time updates, ROS hook).