# FAIR & Reproducible Research — Versioned Data & Code — Hands-on

Build FAIR and reproducible analysis practices for omics and clinical machine learning projects. This module focuses on data and metadata management, Git and data versioning, environment capture, workflow documentation and practical templates so that your work is re runnable, auditable and shareable.

## FAIR & Reproducible Research — Versioned Data & Code

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**Session Index**



**Session 1**

**Fee: Rs 8800** Apply Now

### FAIR Principles & Reproducible Mindset

FAIR and reproducible research basics

**Findable, Accessible, Interoperable, Reusable** | **reproducible vs replicable vs robust** | **why this matters in omics and clinical ML**

From ad hoc analysis to structured projects

**project folder conventions** | **naming patterns for files**

and outputs documenting decisions as you go

Roles, collaboration and responsibility sharing

analyst, PI and data steward roles simple team agreements and checklists expectations for future maintainers

Session 2

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## Data, Metadata & Versioned Storage

Data and metadata organisation patterns

raw, interim and processed layers metadata tables and data dictionaries basic standards and schemas for omics

Versioning data sets with simple tools

Git friendly layouts for large files data version control ideas (eg. DVC style) tracking provenance from input to output

Storage, backup and access policies

local, network and cloud storage choices snapshotting and backup basics simple access control patterns

Session 3

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## Code, Environments & Workflow Capture

Version controlling analysis code with Git

branching and pull request habits commit messages that tell a story tags and releases for milestones

Capturing environments and dependencies

**conda, virtualenv and requirements files** **lock files and environment exports** **container images for stable reruns**

Recording workflows and pipeline steps

**notebooks vs scripts vs workflow tools** **simple directed acyclic workflow diagrams** **logs and run manifests for each execution**

**Session 4**

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## Templates, Audits & Project Deliverables

Checklists and templates for daily work

**README and contributing templates** **analysis plan and protocol skeletons** **issue and change log patterns**

Internal reviews and reproducibility audits

**rerun by colleague test** **common failure modes and fixes** **simple audit trail summary documents**

Deliverables: reproducible project package

**versioned repo with data pointers** **environment and workflow definitions** **rerun instructions for reviewers and collaborators**