

# Data Science & Machine Learning

## Learn to Clean Data, Ask Better Questions, and Build Honest Analysis Workflows

Data work is not only machine learning. It starts with understanding the problem, cleaning the data properly, choosing the right metric, and explaining what the analysis really means. This course helps disciplined entry-level learners move from spreadsheet comfort to Python-based analysis, SQL querying, statistical reasoning, dashboards, and well-explained starter ML workflows.

The goal is not to pretend you become a senior data scientist in one batch. The goal is to leave with strong analyst foundations, one serious final project, and the confidence to reason through data problems instead of copying notebook tutorials.

### Why This Course?

#### The Market Reality

**Global Context:** Organizations keep needing people who can clean messy data, investigate questions carefully, and explain findings in ways that improve decisions instead of creating more noise.

**Nepal Context:** Banks, telecoms, education businesses, SaaS teams, and operations-heavy companies in Nepal are steadily increasing their use of reporting, experimentation, and analytics. The supply of people who can combine Python, SQL, spreadsheet thinking, and clear business communication is still limited.

**Your Opportunity:** This course positions you for **data analyst, junior analytics, BI, and starter data-science workflow roles**. You graduate with practical analysis projects, a final case study, and clearer proof that you can work through real data instead of only classroom examples.

Nepal-Relevant Reality	Opportunity
More teams are using dashboards, reporting, and analytics in everyday operations	Entry-level analytics work is becoming easier to justify and hire for
Many learners know spreadsheets but not Python + SQL together	You can stand out by combining both worlds
Employers need clearer decision support, not only prettier charts	Strong analysis + communication becomes a hiring advantage

Nepal-Relevant Reality	Opportunity
Junior candidates often overfocus on ML hype	You gain a more believable, job-ready foundation

## Course Snapshot

Parameter	Details
Course Code	TR-02
Title	Data Science & Machine Learning
Duration	3.5 Months (14 Weeks)
Schedule	Monday to Friday (Mon–Fri, 5 Days/Week), 2 Hours/Day
Total Hours	140 Hours of Live Training
Batch Size	Maximum 10 Students
Course Fee	NPR 35,000
Prerequisites	Complete Khan Academy Statistics and Probability (units 1-2) and Algebra Basics (variables and equations) before Day 1. Practice 10 Google Sheets formulas before the batch: SUM, AVERAGE, IF, VLOOKUP, COUNTIF, SUMIF, MIN, MAX, SORT, and FILTER. You should also be comfortable creating folders, organizing files, and opening CSV/Excel files on your laptop. A laptop with 8GB+ RAM is recommended. A Saarathi pre-course data challenge is assigned after enrollment. Saarathi Gate Assessment (diagnostic, no pass/fail) before Day 1.
Self-Study	Minimum 2 hours/day outside class (mandatory)
Outcome	Data Analyst / Junior Data Scientist

## Your Learning Week

Day	Activity
Mon–Fri	2-hour live class session (hands-on, project-based)
Mon–Fri	Minimum 2 hours self-study & practice (mandatory)
Saturday	No classes - flexible self-study, peer collaboration, project work

Day	Activity
Sunday	Whole day self-learn time. Classrooms remain fully open for you to come in, study, collaborate with peers, and build projects.

*Every student must spend at least 2 dedicated hours a day on focused analysis and practice beyond the classroom. That habit matters as much as the tools.*

## Week-by-Week Curriculum

### Phase 1: Analyst Foundations & Data Handling (Weeks 1–4, 4 Weeks, 40 Hours)

Week	Focus Area	What You'll Master
Week 1	Python Fundamentals & Notebook Habits	Python setup, variables, conditions, loops, functions, file handling, Jupyter workflow, and how real analysis differs from tutorial copying
Week 2	Python for Tabular Data & Spreadsheet Bridge	Records, reusable cleaning helpers, strings and dates, row-wise thinking, and spreadsheet-to-code translation
Week 3	NumPy, Pandas & Data Cleaning	Arrays, DataFrames, missing values, grouping, merging, and analysis-ready table preparation
Week 4	SQL & Data Sourcing Workflow	PostgreSQL queries, joins, CTEs, aggregation, Python-SQL integration, and structured intake from CSV, Excel, or APIs

### Phase 2: Statistics, EDA & Decision Framing (Weeks 5–7, 3 Weeks, 30 Hours)

Week	Focus Area	What You'll Master
Week 5	Descriptive Statistics & Distribution Thinking	Central tendency, spread, outlier handling, correlation, and stronger question framing
Week 6	Sampling, Probability & Hypothesis Testing	Sampling logic, confidence intervals, p-values, effect size, and common interpretation mistakes
Week 7	EDA, Visualization & Decision Framing	Chart choice, exploratory analysis workflow, recommendation writing, and explaining uncertainty to non-technical people

## Phase 3: Visualization, Dashboards & Starter ML (Weeks 8–11, 4 Weeks, 40 Hours)

Week	Focus Area	What You'll Master
Week 8	Dashboards & Shareable Analysis	Streamlit delivery, dashboard structure, Power BI awareness, and stakeholder-facing summaries
Week 9	ML Workflow & Regression	Train/test thinking, leakage prevention, regression, evaluation metrics, and baseline comparison
Week 10	Classification, Segmentation & Evaluation	Classification metrics, imbalance awareness, clustering, segmentation, and recommendation writing
Week 11	Feature Engineering & Model Explanation	Practical feature work, leakage checks, model explanation, workflow reliability, and limitation writing

## Phase 4: Validation, Capstone & Career Readiness (Weeks 12–14, 3 Weeks, 30 Hours)

Week	Focus Area	What You'll Master
Week 12	Validation, Testing & Lightweight Delivery	Data validation, reproducibility, testing helpers, and delivery trade-offs
Week 13	Capstone Sprint	Problem framing, scoped analysis, EDA, modeling or experimentation, dashboard/report, and documentation
Week 14	Portfolio, Interviews & Career Launch	Resume, LinkedIn, GitHub polish, SQL/case interviews, project explanation, and job-search planning

## Skills You'll Gain

### Languages & Tools

Technology	Proficiency Level
Python 3	Working analyst-level proficiency
pandas & NumPy	Core data handling
SQL (PostgreSQL)	Querying and structured analysis
scikit-learn	Starter ML workflows

Technology	Proficiency Level
matplotlib, Seaborn & Plotly	Visual analysis and storytelling
Streamlit	Shareable dashboard delivery
Power BI	Reporting awareness
pytest	Validation and testing habits

## Development Tools

Tool	Application
Jupyter Notebooks	Analysis environment
Git & GitHub	Version control and portfolio proof
VS Code	Development environment
AI Coding Assistants	Debugging, explanation checks, and workflow support

## Topic Depth and Awareness

Section	Guidance
Purpose	This course separates what you must practice deeply from what you only need to understand with working awareness.
Depth	Python, pandas, SQL, data cleaning, EDA, statistics, experiment reasoning, regression/classification evaluation, and visual communication
Awareness	Power BI publishing, advanced DAX, deeper boosting techniques, and lightweight API packaging patterns
How to use this syllabus	Spend most of your self-study time strengthening the depth topics first. Use awareness topics to broaden judgment, not to distract yourself from fundamentals.

## Project Pool

*All options below are **intermediate-level final projects**. Each student chooses **one** final project from this pool. Trainers may run smaller guided exercises during the course, but public phase-*

wise project sections are intentionally removed so the completion standard stays clear and consistent.

#	Final Project Choice	What You Will Build	Core Stack / Tools
1	Data Cleaning & Query Workflow	Clean, reshape, and query messy business data with Python and SQL before turning it into usable analysis.	Python, SQL, Pandas, data cleaning
2	Decision Analysis Case Study	Analyze a business question with statistics, visual evidence, and written recommendations that a stakeholder can understand.	Statistics, hypothesis testing, visualization, business communication
3	Interactive Analytics Dashboard	Build a stakeholder-ready dashboard with clear KPIs, drill-down views, and narrative structure.	Power BI / Streamlit, KPI design, data storytelling, dashboard UX
4	Segmentation & Starter Model Project	Build one sensible clustering or prediction workflow with feature engineering, evaluation, and explanation.	Scikit-learn, feature engineering, model evaluation, explainability
5	Trainer-Scoped Data Analysis Capstone	Combine cleaned data, analysis, a dashboard or report, and documentation into one trainer-reviewed final project.	Python, SQL, Power BI / Streamlit, documentation

## Career Paths & Trajectory

Role Path	Focus and Proof	Stage and Timeline	What Actually Matters
Data Analyst / Reporting Analyst	Clean data, build recurring reports, and turn messy information into decision-ready views. Proof you leave with: EDA proof, SQL fluency, and clearer reporting skills	Entry role - first 0–2 years	Reliable SQL, careful data cleaning, and explaining findings without overstating certainty.
BI Analyst / Analytics Associate	Build dashboards, KPI definitions, and recurring analysis workflows for teams that rely on operational reporting. Proof you leave with: BI portfolio, metric design, and stakeholder-ready storytelling	Growth role - 1–3 years	Stronger metric judgment, cleaner workflow ownership, and better stakeholder communication.

Role Path	Focus and Proof	Stage and Timeline	What Actually Matters
Junior Data Scientist / Product Analyst	Build and evaluate starter models or experimentation workflows that answer business questions responsibly. Proof you leave with: Modeling portfolio, experimentation awareness, and applied analytics confidence	Specialist path - 2-4 years	Good problem framing, evaluation honesty, and knowing when simple analysis beats fancier modeling.
Senior Data Analyst / Data Scientist	Lead more important analytical work, improve evaluation standards, and guide teams toward better decision quality. Proof you leave with: Analysis systems, clearer recommendations, and higher-trust data work	Senior path - 4+ years	Judgment, reproducibility, and making analysis useful enough that teams actually act on it.

## Saarathi Gate & Completion Review

### Before You Start: Saarathi Gate Assessment

All students complete the **Saarathi Gate Assessment** before Day 1. It is a short diagnostic review of aptitude, learning behaviour, and thinking style. It has **no pass/fail** and is used only to tailor support from the start.

### After Course Completion: Saarathi Completion Review

The **Saarathi Academy Certificate** is issued after the selected final project is completed, documented, and reviewed by the trainer. There is **no separate certification exam** for this course.

#### Completion Requirements:

- Attendance:** Minimum 80% attendance
- Weekly Work:** Core deliverables, revision work, and practice tasks completed
- Final Project:** One intermediate-level project selected from the project pool and completed to trainer-approved quality
- Portfolio Proof:** Screenshots, documentation, case-study notes, or equivalent proof assets updated
- Trainer Review:** Practical execution, consistency, communication, and overall growth signed off by the trainer

## Enrollment & Next Steps

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**Next Batch:** Starting soon (contact for exact dates) **Offline Location:** Old Baneshwor Chowk, Kathmandu, Nepal **Mode:** Online + Offline **Contact (Call/WhatsApp):** 9761095364, 9744442469

>> [ENROLL NOW] - Limited to 10 seats per batch

*Turn messy data into decisions - and be able to explain every step.*

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