

■ Financial Risk Prediction Model Plan

1. Evaluation Metrics

A. Accuracy & Performance Metrics:

Metric	Description	Importance
Accuracy	Overall correct predictions	Basic performance check
Precision	Correct positive predictions / Total predicted positives	Avoid false alarms
Recall	Correct positive predictions / Total actual positives	Catch true defaulters
F1-Score	Harmonic mean of precision & recall	Balances precision and recall
ROC-AUC	Area under ROC curve	Discrimination capability
KS Statistic	Max separation between good/bad borrowers	Industry standard

B. Fairness & Bias Metrics:

Metric	Description	Why It Matters
Demographic Parity	Equal approval rates across groups	Detects over-representation
Equal Opportunity	Equal true positive rates	Ensures qualified applicants are treated equally
Equalized Odds	Equal TPR and FPR across groups	Balanced fairness
Disparate Impact Ratio	Ratio of positive outcomes between groups	Should be between 0.8 - 1.25
Calibration by Group	Probability scores match outcomes across groups	Avoids over/underconfidence

2. Bias Mitigation Techniques

- A. Pre-processing: Reweighting, SMOTE, Disparate Impact Remover
- B. In-processing: Adversarial Debiasing, FairBoost, Fairness Constraints
- C. Post-processing: Equalized Odds, Reject Option Classification, Group Calibration

3. Summary Table

Stage	Example Technique	Target Goal
Pre-processing	Reweighting, SMOTE	Balance representation
In-processing	Adversarial Debiasing	Reduce learned bias
Post-processing	Equalized Odds	Adjust predictions fairly