



**PURPOSE**

This handbook page gives learners and supervisors a clean shortlist of strong AI capstone options, the minimum deliverables expected for each project, and the evaluation focus that aligns with responsible AI, reproducibility, and professional presentation standards.

## Example Capstone Projects

Capstone Project	Problem Focus	Practical Application	Typical Tools / Models	Core Deliverables	Evaluation Focus
AI Fraud Detection Model	Detect suspicious or fraudulent transactions	Banking, fintech, e-commerce, insurance	Python, Pandas, Scikit-learn, XGBoost, anomaly detection	Source code; project documentation; model evaluation report	Precision, recall, F1-score, ROC-AUC, false-positive reduction
AI Cybersecurity Intrusion Detection System	Detect attacks, anomalies, and malicious traffic	SOC operations, cloud security, IoT security	Python, Scikit-learn, PyTorch/TensorFlow, autoencoders, Isolation Forest	Source code; project documentation; model evaluation report	Detection rate, false-positive rate, precision, recall, latency
AI Healthcare Prediction Model	Predict disease risk, deterioration, or readmission	Hospitals, clinics, telemedicine	Python, XGBoost, logistic regression, neural networks, SHAP/LIME	Source code; project documentation; model evaluation report	Accuracy, sensitivity, specificity, ROC-AUC, calibration
AI Student Performance Prediction System	Identify at-risk learners and forecast outcomes	Schools, universities, e-learning	Python, Scikit-learn, decision trees, boosting, dashboards	Source code; project documentation; model evaluation report	Accuracy, recall for at-risk students, intervention value, fairness
AI Resume Screening and Job Matching System	Match candidates to roles from skills and experience	HR tech, recruitment, workforce planning	NLP, BERT, TF-IDF, similarity and ranking models	Source code; project documentation; model evaluation report	Precision@k, ranking quality, fairness, explainability
AI Predictive Maintenance Model	Forecast equipment failure before breakdown	Manufacturing, transport, utilities, aerospace	Time-series ML, random forest, LSTM, sensor analytics	Source code; project documentation; model evaluation report	RMSE/MAE, precision, recall, downtime reduction
AI Loan Default Prediction Model	Estimate borrower repayment risk	Banking, microfinance, credit scoring	Logistic regression, XGBoost, explainable AI tools	Source code; project documentation; model evaluation report	ROC-AUC, precision, recall, fairness, explainability

Capstone Project	Problem Focus	Practical Application	Typical Tools / Models	Core Deliverables	Evaluation Focus
AI Disease Outbreak Early Warning System	Detect emerging outbreak signals early	Public health, biosurveillance, epidemic monitoring	Time-series analytics, anomaly detection, NLP, geospatial tools	Source code; project documentation; model evaluation report	Detection lead time, sensitivity, alert quality, robustness

## Standard Deliverables for Every Capstone

Deliverable	What it should contain
Source code	Data preprocessing, model training, testing/evaluation scripts, prediction module, dashboard or API, requirements file, and README.
Project documentation	Title page, abstract, introduction, problem statement, objectives, dataset description, methodology, architecture, workflow, ethics/compliance notes, limitations, and conclusion.
Model evaluation report	Dataset split, metrics, charts, confusion matrix or error table, ROC curve where relevant, error analysis, bias/fairness discussion, and improvement recommendations.

## Program Adoption Guidance

Project starter sequence	Assessment standards
<ol style="list-style-type: none"> <li>1. AI Fraud Detection Model</li> <li>2. AI Cybersecurity Intrusion Detection System</li> <li>3. AI Healthcare Prediction Model</li> <li>4. AI Predictive Maintenance Model</li> <li>5. AI Student Performance Prediction System</li> </ol>	<ul style="list-style-type: none"> <li>Clear real-world problem framing</li> <li>Responsible dataset handling and preprocessing</li> <li>Measurable results with charts and interpretation</li> <li>Ethics, fairness, privacy, and governance discussion</li> <li>Readable documentation and reproducible code structure</li> </ul>

## Alignment Note

These capstone formats align well with risk-based AI governance and trustworthy-AI teaching approaches that emphasize documentation, measurement, human oversight, and lifecycle management. The structure is consistent with the NIST AI RMF, ISO/IEC 42001, and the OECD AI Principles.

## References

- National Institute of Standards and Technology. (2023). Artificial Intelligence Risk Management Framework (AI RMF 1.0). NIST AI 100-1.
- National Institute of Standards and Technology. (2024). Artificial Intelligence Risk Management Framework: Generative AI Profile. NIST AI 600-1.
- ISO. (2023). ISO/IEC 42001:2023 — Information technology — Artificial intelligence — Management system.
- OECD. (2024). OECD AI Principles.