
SYLLABUS FOR BOARD OF STUDIES ADOPTION — generated from the live catalogue record

Machine Learning with Python and scikit-learn

S-03A · 5 days (configurable 1–5 days) · Informatics · AI · Years: 3rd, PG

CONTENTS

1. Overview	2
2. Hours and credit position	2
3. Course outcomes	2
4. Course content — modules	2
5. Assessment scheme (100 marks)	3
6. CO–PO mapping	3
7. Every participant receives	3
8. Fee	3
9. Designed by	3

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OVERVIEW

End-to-end: data preparation, model selection, evaluation and a deployed prediction service.

Machine learning is the fastest-growing skill demand across sectors; an end-to-end project from data to a deployed model gives students a portfolio piece and genuine competence.

HOURS AND CREDIT POSITION

Contact hours: 40 Guided project: 20 Self-study: 0 Notional total: 60

Credit claim: 2

60 notional hours ÷ 30 hours per credit (NSQF track, UGC Micro-credentials Guidelines §5.3.3) = 2 credits.

COURSE OUTCOMES

CO1. Prepare a raw dataset for modelling through cleaning, encoding and scaling (K3)

CO2. Build supervised regression and classification models with scikit-learn (K3)

CO3. Evaluate a model using cross-validation and appropriate metrics (K4)

CO4. Tune hyperparameters to reduce overfitting (K4)

CO5. Deploy a trained model as a prediction service (K3)

COURSE CONTENT — MODULES

Hours shown are the recommended format; module time scales proportionally when the engagement runs 1–5 days.

Module 1 — ML foundations and workflow (5h recommended)

Theory: Problem framing, the ML pipeline, train/test discipline

Lab: Frame a problem and split a dataset correctly

Output: Problem-framing note

Module 2 — Data preparation (5h recommended)

Theory: Cleaning, encoding, scaling, feature engineering

Lab: Prepare a raw dataset for modelling

Output: Prepared dataset + notebook

Module 3 — Regression (5h recommended)

Theory: Linear and regularised regression, evaluation metrics

Lab: Build and evaluate a regression model

Output: Regression notebook

Module 4 — Classification (5h recommended)

Theory: Logistic regression, decision trees, k-NN, support vector machines

Lab: Build and compare classifiers

Output: Classification notebook

Module 5 — Evaluation and tuning (5h recommended)

Theory: Cross-validation, hyperparameter search, over- and underfitting

Lab: Tune a model with cross-validation

Output: Tuning report

Module 6 — Ensemble methods (5h recommended)

Theory: Random forests, gradient boosting

Lab: Improve results with ensembles

Output: Ensemble notebook

Module 7 — Unsupervised learning (5h recommended)

Theory: Clustering, dimensionality reduction

Lab: Cluster a dataset and interpret the groups

Output: Clustering notebook

Module 8 — Deployment capstone (5h recommended)

Theory: Packaging a model, serving predictions

Lab: Deploy the best model as a service

Output: Deployed prediction service

ASSESSMENT SCHEME (100 MARKS)

Continuous lab exercises — 40 marks
Capstone project & demonstration — 40 marks
Quiz & viva voce — 20 marks

CO-PO MAPPING

CO1 !' PO3 (strength 2)

Data preparation is solution development.

CO2 !' PO3 (strength 2)

Model building is solution development.

CO3 !' PO4 (strength 2)

Model evaluation is experimental investigation.

CO4 !' PO4 (strength 2)

Tuning is investigation of model behaviour.

CO5 !' PO5 (strength 2)

Deployment is modern-tool usage.

EVERY PARTICIPANT RECEIVES

- Certificate of completion
- Course material
- LMS access
- Interview question bank
- Mock interview & viva practice
- Optional nasscom NSQF assessment (priced per candidate on your quotation)

FEE

13,200 per student, incl. GST

Excludes the optional nasscom assessment where offered. Final pricing on your college's quotation.

DESIGNED BY

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