
IBM AICTE PROJECT

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Problem Statement

Problem Statement No.14 Syllabus and Curriculum Design Optimizer

The Syllabus and Curriculum Design Optimizer is an AI tool that helps faculty create and improve course content of Machine Learning subject in SRM University. It analyzes syllabi, suggests improvements, aligns topics with learning outcomes, and generates draft syllabi. It automates tasks like mapping outcomes and updating reading lists, saving time and enhancing curriculum quality.

Problem Solution

Implement a Watsonx AI assistant (Granite model) with integrated search tools (Google, DuckDuckGo, Wikipedia, Document Search). This AI will analyze the existing syllabus, research current trends, and provide automated recommendations for topic updates, outcome alignment, resource updates, and assessment strategies, streamlining the process and improving curriculum quality.

Technology Used

- IBM cloud lite services
- Natural Language Processing (NLP)
- Retrieval Augmented Generation (RAG)
- IBM Granite model

IBM Cloud Service Used

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

Wow Factor

Transform your curriculum development with the Syllabus Optimizer AI, designed to dramatically reduce faculty workload, enhance syllabus quality, ensure alignment with learning outcomes, and foster innovation in course design.

Key features include:

- AI-powered syllabus analysis: Identify areas for improvement and potential gaps.
- Automated content recommendations: Discover relevant topics, readings, and assessments.
- Learning outcome alignment: Ensure seamless integration of course content with objectives.
- Up-to-date trend integration: Incorporate the latest academic and industry advancements.
- Draft syllabus generation: Create comprehensive syllabi in minutes.
- Streamlined formatting and updates: Automate repetitive tasks for maximum efficiency.

End User

- Faculty/Professors
- Instructional Designers
- Department Chairs/Heads
- Curriculum Committees
- Accreditation Teams
- New Faculty Members
- Teaching Assistants (TAs)

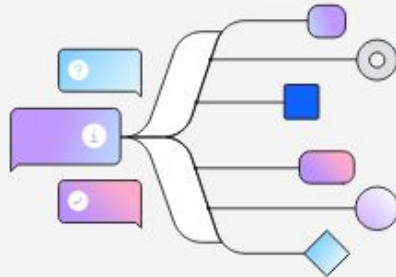
Agent preview



Problem Statement No.14– Syllabus and Curriculum Design Optimizer 06:11 PM

Welcome to Problem Statement No.14– Syllabus and Curriculum Design Optimizer

An AI agent that can be used to organize and summarize Machine Learning Syllabus of SRM University.



Type something...



Result

Agent preview



You: 06:19 PM

give me unit 1 syllabus of machine learning



Problem Statement No.14– Syllabus and Curriculum Design Optimizer 06:19 PM

Here is the Unit 1 syllabus for Machine Learning:

Unit-1 - Introduction

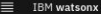
- What is Machine Learning?
- Supervised vs Unsupervised Learning
- Polynomial Curve Fitting
- Probability Theory:
 - Discrete Random Variables
 - Fundamental Rules
 - Bayes Rule
 - Independence and Conditional Independence
 - Continuous Random Variables
 - Quantiles, Mean and Variance
 - Probability Densities
 - Expectation and Covariance

Type something...



Result

Result - Deployed Agent

 Upgrade ⓘ ⓘ Arnab Gupta's Account ▾ Dallas ▾ AG ⋮

Deployment spaces / Deployment / Problem Statement No.14- Syllabus and Curriculum Design Optimizer /

Problem Statement No.14- Syllabus and Curriculum Design Optimizer Deployed Online

API reference Test **Preview**

New chat +

You 06:22 PM

can you tell about the document you have

Problem Statement No.14- Syllabus and Curriculum Design Optimizer 06:22 PM

The document provided appears to be a syllabus for a Machine Learning course, likely for a B.Tech or M.Tech program. It details the course's purpose, learning outcomes, and course outcomes. The course is divided into five units:

- 1. Introduction:** Covers the basics of machine learning, types of learning (supervised and unsupervised), polynomial curve fitting, and fundamental probability theory including discrete and continuous random variables, Bayes' rule, independence, conditional independence, quantiles, mean, variance, probability densities, expectation, and covariance.
- 2. Linear Models for Regression:** Discusses maximum likelihood estimation, least squares, robust linear regression, ridge regression, and Bayesian linear regression. It also covers linear models for classification, discriminant functions, probabilistic generative models, probabilistic discriminative models, Laplacian approximation, Bayesian logistic regression, kernel functions, using kernels in GLMs, kernel trick, and Support Vector Machines (SVMs).
- 3. Mixture Models and EM:** This unit covers K-means clustering, mixtures of Gaussians, an alternative view of the Expectation-Maximization (EM) algorithm, factor analysis, Principal Component Analysis (PCA), and choosing the number of latent dimensions. It also discusses clustering methods, measuring dissimilarity, evaluating clustering outputs, and hierarchical clustering.
- 4. Hidden Markov Models:** This unit introduces Hidden Markov Models (HMM), maximum likelihood for HMM, forward and backward algorithms, sum-product algorithm, scaling factors, Viterbi algorithm, and linear dynamical systems.
- 5. Combining Models:** This unit discusses Bayesian model averaging, boosting, adaptive basis function models, CART, generalized additive models, and ensemble learning.

Type something...

Conclusion

The Syllabus Optimizer AI generates draft syllabi, recommends content updates, and ensures alignment with learning outcomes. It saves time by automating repetitive tasks like formatting and updating reading lists. Syllabus Optimizers enhance efficiency, consistency, and innovation in curriculum development across academic programs.

Github Link :

<https://github.com/arnav4o4/Syllabus-Optimizer-WX-Agent>

The screenshot shows the GitHub repository page for 'Syllabus-Optimizer-WX-Agent' by user 'arnav4o4'. The repository is public and has 1 branch (main) and 0 tags. The commit history shows an 'Initial commit' by 'arnav4o4' 1 minute ago, with a commit hash of 6ba7ae8. The repository contains a single file, 'README.md', which was also committed 1 minute ago. The README content describes the project as an AI agent for organizing and summarizing Machine Learning syllabi for SRM University. The right sidebar shows the repository's statistics: 0 stars, 0 watching, and 0 forks. There are no releases or packages published yet.

Syllabus-Optimizer-WX-Agent Public

Pin Watch 0 Fork 0 Star 0

main 1 Branch 0 Tags

Go to file Add file <> Code

arnav4o4 Initial commit 6ba7ae8 · 1 minute ago 1 Commit

README.md Initial commit 1 minute ago

README

Syllabus-Optimizer-WX-Agent

An AI agent that can be used to organize and summarize Machine Learning Syllabus of SRM University.

About

An AI agent that can be used to organize and summarize Machine Learning Syllabus of SRM University.

- Readme
- Activity
- 0 stars
- 0 watching
- 0 forks

Releases

No releases published
[Create a new release](#)

Packages

No packages published
[Publish your first package](#)

Future Scope

- Personalized learning paths
- AI-driven assessment generation
- Real-time feedback integration
- Expanded data sources
- Multilingual support
- Accessibility tool integration
- Predictive analytics for success

IBM Certificates

Getting Started
with Artificial Intelligence

edunet
foundation

In recognition of the commitment to achieve
professional excellence



Arnav Gupta

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/557c2c36-9bf9-4650-bf8b-e1dc2ccad1a9>



IBM Certificates

Lab :

Retrieval Augmented Generation
with LangChain

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Completion Certificate



This certificate is presented to

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**Lab: Retrieval Augmented Generation with
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(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 16 Jul 2025 (GMT)

Learning hours: 20 mins



**THANK
YOU**

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foundation

