PRAGYAN AI
Grow with Gyan

Master's Certificate Program (MCP) in Data Science, AI, GenAI & AgenticAI – 3 Years UpSkill Program with Placement

Mode: **Hybrid (Online + Offline)**
Schedule:

Offline (Face to Face Session):

- 3rd Sem: 2 Weeks Full-Day Offline
- 4th Sem: 2 Weeks Full-Day Offline
- 5th Sem: 2 Weeks Full-Day Offline
- 6th Sem: 2 Weeks Full-Day Offline
- 7th Sem: 4 Weeks Full-Day Offline
- 8th Sem: 4 Weeks Full-Day Offline

Online - Instruction Led

- 36 Months Online (2 Sessions/week × 2 hrs) - Excluding Exams, and Other Internals and other Academic Hectic Months

Duration: ~2000+ Hours (550+ Offline, 1500+ Online)
Projects: 150+ Projects, 70+ AI Tools & Libraries, 3–5 Real World Capstone Projects

Focus Areas:

- **8 Key Skills**
  - Python Full Stack,
  - Data Science,
  - BI/Data Analytics
  - Machine Learning,
  - Deep Learning & Computer Vision
  - NLP & AI Bot,

- ○ Generative AI - LLM, Prompt Engineering,
- ○ Agentic AI, MultiAgentic AI, MCP
- **Extra Brief Modules (Overview) Complementary**
  - ○ Cloud AI - 7th Semester,
  - ○ Big Data Analytics
  - ○ SQL/NoSQL, Agile based Project Management, Project Management Tools(JIRA, GITHub, Etc) , Whole Product Development Process
- **DSA & Core CSE Concepts Refresh (2 Weeks - Online Complementary)**
- **Aptitude and SoftSkill (2 Weeks - Online - Complementary)**

Add-Ons:

- Monthly Project Demo, Top Three Projects Will Get Prize
- Hackathons
- Research Paper,
- Mock Interviews - 4 Technical, 2 HR and GD
- Profile Building - Resume, Linkedin, Github etc
- 1:1 Career Mentoring
- Real World Capstone Projects
- Internships
- Final Year Project

Certification: 8 Skill Certificates + 1 Master Certificate
Fees: **Part 1:** ₹10,000 per semester → ₹60,000 total.

Part 2: Pay After Placement: (Below 5 LPA → ₹25K, 5–10 LPA → ₹50K, 10+ LPA → ₹1L)
Placement: 100% Placement (Salary Range: 4–30 LPA). AIms to place at higher Package
Eligibility: From 2nd Year onwards, CSE & Allied Branches, EC Branch with 7.5+ CGPA. Minimum 50+ Students from college required for above price and offline course

PRAGYAN AI
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Special Offers / Terms for GNDEC

1. Look Out Period:
   a. 3rd Semester - if students not happy after 1 full semester training, We will refund program fee
2. Special Program Fee
   a. Our Actual Cost is 25K per Semester, we are charging 10K per Semester Specially for **GNDEC**
3. If Students Not Placed: within 6 Months of Program completion
   a. 50% Program Fee Refunded
   b. Terms
      i. 85% attendance and completion of all assignments and exams, hackathon and Papers etc.
4. If Students Placed by College or Self by Students
   a. Only 50% of the after placement fee.
   b. If Placed by PragyanAI - Then Pay 100% After Placement Pay after getting offer letter

Program Road Map:

3rd Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start):

- **Python Full Stack & Data Processing/Data Wrangling**
  - Full Python - Includes Exceptional Handling, File Handling, DB Connectivity, Regular Expressions, OS/Utility Commands
  - Numpy
  - Pandas
  - Image Processing - Numpy, Pillow, OpenCV
  - Audio Processing - Using Numpy and Other Libs
  - Video Processing - Using Other Libs
  - Python Utility Projects

- Data Wrangling Using Pandas and Numpy
- Web Scraping
- **Overall 10+ Case Studies / Small Projects - Across above Topics**
- **IDE Tool: Google Colab, Kaggle NoteBook**
- **Key Libs/Tools Covered**
  - NumPy → Foundation for numerical computing, arrays, linear algebra, FFT, random numbers.
  - SciPy → Scientific computing, optimization, signal processing, integration, stats.
  - Pandas → DataFrames, Series, tabular data handling, grouping, merging, time-series.
  - Dask → Scalable parallel computation on large datasets (pandas-like).
  - Polars → High-performance DataFrame library (Rust-based, faster than pandas).
  - Vaex → Lazy, out-of-core DataFrame handling for huge datasets.
  - Pillow (PIL fork) → Basic image processing: resize, crop, filter, convert formats.
  - OpenCV (cv2) → Advanced computer vision: filtering, edge detection, object detection, face recognition.
  - scikit-image → Image segmentation, transformations, filtering, feature extraction.
  - imageio → Simple reading/writing of images, videos, GIFs.
  - Librosa → Music & audio analysis (spectrograms, tempo, pitch, MFCCs).
  - PyDub → High-level audio editing (cutting, merging, exporting to mp3/wav).
  - Soundfile → Read/write audio files with more formats support.
  - SpeechRecognition → Speech-to-text (uses Google API, Sphinx, etc.). Text to Speech, Speech to Text
  - MoviePy → Video editing (cut, concatenate, add audio/text, effects).
  - PyAV → Pythonic bindings for FFmpeg (powerful for encoding/decoding video).
  - imageio-ffmpeg → Lightweight FFmpeg wrapper for video reading/writing.
  - scikit-video → Utilities for video processing.

- ○ ffmpeg-python → wrapper around FFmpeg for encoding/decoding.
- ○ **One or Two Libs Among Listed Below**
  - ■ pytube → download YouTube videos/audio streams.
  - ■ youtube-dl / yt-dlp (modern fork) → robust YouTube/video platform downloader.
  - ■ PyTube3 → improved version of pytube.
  - ■ youtube-transcript-api → fetch subtitles/transcripts of videos.
  - ■ youtube-search-python → search YouTube videos programmatically.
  - ■ pafy → get metadata, streams from YouTube.
  - ■ ytmusicapi → access YouTube Music playlists, songs.
- ○ **Requests** → HTTP library for fetching web pages.
- ○ **BeautifulSoup (bs4)** → Parse HTML/XML easily.
- ○ **One or Two from Libs from below**
  - ■ lxml → Fast parsing of HTML/XML with XPath support.
  - ■ Scrapy → Full-fledged web crawling & scraping framework.
  - ■ Selenium → Automate browsers (JavaScript-heavy sites).
  - ■ Playwright / Puppeteer (Pyppeteer) → Headless browser automation.
  - ■ newspaper3k → Extract articles, titles, summaries from news sites.
  - ■ Click / argparse → Command-line tools.
  - ■ logging / rich / loguru → Logging and pretty console outputs.
  - ■ tqdm → Progress bars for loops.
  - ■ schedule / APScheduler → Task scheduling.
  - ■ PyInstaller → Convert Python scripts to executables.
- ● **Evaluation**
  - ○ **Assignments**
    - ■ Coding & Project Based
    - ■ MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)
  - ○ **Exam**
    - ■ Project Challenge - Need to Submit - in 2-3 Weeks

4th Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start)

- **Data Science Foundation & Advance Data Wrangling**
    - Statics & Math Foundation
        - Sampling, Distributions, Descriptive & Inferential Statics, ANOVA, Hypothesis Handling and etc
        - Probability and Other Key Concepts
    - Data Visualization
    - Data Science - Life Cycle & Introduction
    - Explorative Data Analysis - EDA
    - Data Analysis
        - Univariate, Bivariate and MultiVariate
    - **Domain Knowledge & Case Studies Across (15 Case Studies/Projects)**
        - Healthcare
        - BSFI
        - Agriculture
        - Supply Chain and Logistic
        - Retail and Ecommerce
        - Sports, Media & Entertainment
        - Sales, Marketing, Operation and HR, Social Media
        - Other
            - **Education** → Student performance prediction, adaptive learning systems
            - **Energy** → Smart grid optimization, renewable energy forecasting

- **Government / Smart Cities** → Traffic prediction, citizen feedback analysis
- Etc
- **Overall 15+ Case Studies / Small Projects - Across above Topics**
- **IDE Tool: Google Colab, Kaggle NoteBook**
- **Key Libs/Tools Covered**
  - SymPy → Symbolic mathematics, equation solving, symbolic differentiation/integration.
  - Math / Statistics (builtin) → Basic math functions, probability, statistics utilities.
  - Statsmodels → Regression, time series analysis, hypothesis testing
  - Pingouin → Advanced statistical tests, effect sizes
  - Matplotlib → Histograms, probability plots
  - Seaborn → Distribution plots, correlation heatmaps
  - Plotly → Interactive probability & math visualizations
  - OpenRefine → Cleaning messy CSV/Excel data
  - **One or Two Among**
    - GeoPandas → Geospatial extension of Pandas, makes working with shapefiles easy.
    - Shapely → For geometric objects and spatial operations.
    - Folium → Builds interactive Leaflet.js maps directly from Python.
    - Rasterio → For raster (satellite) imagery handling.
    - HoloViews + GeoViews → Declarative geospatial visualization.
    - Leafmap → Simplified geospatial visualization with interactive Jupyter maps.
    - Panel + Holoviz → Interactive dashboards with multiple visualizations.
  - **Exploratory Data Analysis (EDA)**
    - Pandas-Profiling, SweetViz, D-Tale → Automated EDA
  - **Either Covered Here or During Deep Learning Module / Machine Learning Module**

- SimpleITK (medical imaging)
- yfinance, TA-Lib
- EarthPy, Rasterio (satellite data)
- **Project Demo: BiMonthly - Online or Offline (College - Need to Conduct)** - On Topics Covered. Exact Dates will be announced later
  - Either Team or Individual - All Projects should be different in either Problem Statement or tool/libraries or datasets or domain
  - Problem statements - Should be selected from our list or students can propose themselves
  - Presentation Template, Project Report Template will Be share
  - Project Evaluation - Peer Evaluation and Faculty Evaluation will Be shared
- Evaluation
  - Assignments
    - Coding & Project Based
    - MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)
  - Exam
    - Project Challenge - Need to Submit - in 2-3 Weeks

5th Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start):

1. **BI / Data Analytics**
   a. Business Intelligence Foundation
   b. Excel & Advance Excel Based Analytics
   c. BI Tools
      i. **Two Tools In Detail and Two In Brief Among Listed Below**
         1. Tabaleu
         2. PowerBI
         3. Google Looker
         4. Metabase – Open-source BI & dashboarding tool

5. Apache Superset – Data exploration, visualization, and dashboard creation
6. Redash – Querying databases and building dashboards
7. KNIME – Open-source analytics platform with drag-and-drop workflows
8. Pentaho Community Edition (Kettle) – ETL + analytics suite
9. Grafana – Great for monitoring & real-time dashboards (works with SQL, NoSQL, time-series DBs)
10. Advance Excel Based
   a. Pivot Tables & Pivot Charts – Summarization & visualization
   b. Power Query – ETL inside Excel (data cleaning & transformation)
   c. Analysis ToolPak – Statistics & regression add-in
   d. XLSTAT – Statistical analysis add-on
   e. Data Analysis ToolPak – Hypothesis testing, ANOVA, regression, forecasting
   f. xlwings – Run Python in Excel for advanced analytics

d. Brief overview About Big Data - Data WearHouse, Data Lake, BIG Data Ecosystem, Spark, PySpark etc

e. Domain Knowledge & Case Studies Across (5-8 Case Studies/Projects)
   i. Healthcare
   ii. BSFI
   iii. Agriculture
   iv. Supply Chain and Logistic
   v. Retail and Ecommerce
   vi. Sports, Media & Entertainment
   vii. Sales, Marketing, Operation and HR, Social Media
   viii. Other
      1. Education → Student performance prediction, adaptive learning systems

2. Energy → Smart grid optimization, renewable energy forecasting
3. Government / Smart Cities → Traffic prediction, citizen feedback analysis
4. Etc

2. **Machine Learning**
   a. Foundation - SuperVised, Unsupervised, And Other Types
   b. ML LifeCycle
   c. Classification - Algorithms(15+ Algo)
      i. LR, KNN, RF, SVM, XGBoost, LightGBM, CatBoost etc
   d. Classification Model Evaluation Matrics
      i. Confusion Matrix, Classification Report, ROC-AUC etc
   e. Regression / Predictive Model - Algorithms(10+)
      i. LR, KNN, Etc
   f. Regression Model Evaluation
      i. MSE, RMSE, R2 Etc
   g. Clustering - Algo(10+ Algorithms)
      i. KMeans, Hierarchy etc
   h. Clustering Model Evaluation
      i. Intrinsic and Extrinsic
   i. Model Optimization - Hyper Parameter Tuning
   j. Feature Engineering - Including Dimension Reduction
   k. **Vibe Coding - Building ML Model using GenAI**
   l. Model Deployment
      i. GitHub, Streamlit, Gradio
      ii. Deploying Models over - Streamlit.io
   m. **Domain Knowledge & Case Studies Across (15+ Case Studies/Projects)**
      i. Healthcare
      ii. BSFI
      iii. Agriculture
      iv. Supply Chain and Logistic
      v. Retail and Ecommerce

      vi.   Sports, Media & Entertainment

      vii.   Sales, Marketing, Operation and HR, Social Media

      viii.   Other

1. Education → Student performance prediction, adaptive learning systems
2. Energy → Smart grid optimization, renewable energy forecasting
3. Government / Smart Cities → Traffic prediction, citizen feedback analysis
4. Etc

3. **Tools & Libs**
   a. Sklearn, XGBoost, LightGBM, CatBoost, scipy, hdbscan
   b. Yellowbrick – Visual diagnostic tools for ML (classification, regression, clustering visualization).
   c. MLxtend – Visualizations for decision regions, classifier comparisons, pipelines.
   d. Scikit-plot – Quick visualization wrappers around scikit-learn models (confusion matrix, ROC curves, calibration plots).
   e. t-SNE (sklearn.manifold) – Visualize high-dimensional data in 2D/3D.
   f. UMAP – Dimensionality reduction, better global structure preservation than t-SNE.
   g. PCA (scikit-learn, matplotlib) – 2D/3D scatter plots of transformed features.
   h. AutoViz – Automated EDA & visualization for feature importance, distributions, correlations.
   i. Optuna / Hyperopt / Ray Tune / Scikit-Optimize – Hyperparameter tuning with visualization dashboards.

4. **Project Demo: BiMonthly - Online or Offline (College - Need to Conduct)** - On Topics Covered. Exact Dates will be announced later
   a. Either Team or Individual - All Projects should be different in either Problem Statement or tool/libraries or datasets or domain
   b. Problem statements - Should be selected from our list or students can propose themselves

    c. Presentation Template, Project Report Template will Be share

    d. Project Evaluation - Peer Evaluation and Faculty Evaluation will Be shared

5. Hackathon - 1

    a. Online Hackathon/Participate Hackathon Suggested - Problem Statements will be given and Final Demo - Online

6. Evaluation

    a. Assignments

        i. Coding & Project Based

        ii. MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)

    b. Exam

        i. Project Challenge - Need to Submit - in 2-3 Weeks

6th Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start):

1. Advance Machine Learning

    a. Recommendation System

        i. TensorFlow Recommenders, Surprise Etc

    b. Time Series

        i. Statsmodels, pmdarima, arch, Facebook Prophet, Etc

    c. Associative Rule / Data Mining

        i. MLxtend, PyFIM Etc

    d. Anomaly Detection

    e. Explainable AI

    f. AutoML - No Code / Low Code Tool

        i. PyCaret, AutoGulcon etc

        ii. LIME (Local Interpretable Model-agnostic Explanations)

        iii. SHAP (SHapley Additive exPlanations)

        iv. InterpretML (Microsoft)

        v. Dtreeviz

        vi. PDPbox

g. Vibe Coding - Building ML Model using GenAI
h. **Domain Knowledge & Case Studies Across (10+ Case Studies/Projects)**
   i. Healthcare
   ii. BSFI
   iii. Agriculture
   iv. Supply Chain and Logistic
   v. Retail and Ecommerce
   vi. Sports, Media & Entertainment
   vii. Sales, Marketing, Operation and HR, Social Media
   viii. Other
      1. Education → Student performance prediction, adaptive learning systems
      2. Energy → Smart grid optimization, renewable energy forecasting
      3. Government / Smart Cities → Traffic prediction, citizen feedback analysis
      4. Etc
i. **10+ Case Studies / Small Projects - across Advance Machine Learning**

2. **Deep Learning & Computer Vision**
   a. Deep Learning Foundation
   b. Tensorflow, Keras And PyTorch Foundation
   c. ANN /MLP
   d. CNN
      i. Classification and Segmentation
      ii. Well Known Model Across Classification and Segmentation
         1. VGG, RegNet, UNet etc
   e. RNN - LSTM, GRU
   f. AutoEncoder
   g. Transfer Learning & Hybrid Models
   h. Advance Image Processing and Data Augmentation Techniques
   i. Model Building and Optimization Technique

     j. Explainable AI
- i. GradCAM, Saliency Maps, What-If Tool (Google AI), Captum (PyTorch), TF-Explain, Alibi (Seldon), What-If Tool (Google AI),TensorBoard etc

     k. Computer Vision
- i. Object Detection & Tracking
- ii. Faces Detection & Recognition
- iii. OCR
- iv. Pose Estimation, Gesture Recognization etc Using MediaPipe and Other Lib
- v. BioMetric -Thumb, Retina etc
- vi. Depth Estimation, Object Counting
- vii. Similarity DL Model

     l. Model Development - Domain Case Studies - Above Mentioned Plus
- i. Healthcare - Including Medical Imaging
- ii. Satellite Image & Autonomous Driving(Automobile)
- iii. Sport - Analytics
- iv. Audio - Music, Voice etc Base
- v. Image Fusion Based

     m. 15+ Case Studies / Small Projects - Across DL & CV

3. **Project Demo: BiMonthly - Online or Offline (College - Need to Conduct)** - On Topics Covered. Exact Dates will be announced later
   - a. Either Team or Individual - All Projects should be different in either Problem Statement or tool/libraries or datasets or domain
   - b. Problem statements - Should be selected from our list or students can propose themselves
   - c. Presentation Template, Project Report Template will Be share
   - d. Project Evaluation - Peer Evaluation and Faculty Evaluation will Be shared

4. **Hackathon - 2**
   - a. Online Hackathon/Participate Hackathon Suggested - Problem Statements will be given and Final Demo - Online

5. **Research Paper - 1 / Internship (At any Company if Students Selected by company from college)**

   a. Team of 2-4 Students with One College Faculty - Topics provided by us
      i. Students have to work in collaboration with Faculty
      ii. PragyanAI will be One Author and PragyanAI will not pay paper publication Fee

6. **Evaluation**
   a. Assignments
      i. Coding & Project Based
      ii. MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)
   b. Exam
      i. Project Challenge - Need to Submit - in 2-3 Weeks

7th Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start):

1. **Advance Deep Learning & Computer Vision**
   a. Transformer - In Detail
      i. Hands on Model Building
   b. GenAI - GAN, VAE, Stable Diffusion
      i. Hands on Model Building
      ii. Image Generation - GAN, VAE Based,
      iii. Style GAN
      iv. Image Captioning - CLIP
      v. Condition GAN
      vi. Super Resolution - SRGAN
      vii. Image-to-image translation (CycleGAN, Pix2Pix).
      viii. GAN/VAE as Data Augmentation
      ix. Diffusion Based Image Generation
   c. Transformer Based - Image Classification, Segmentation etc
   d. Advance SOTA Model
      i. SAM, DIVNO, VIT, Etc
   e. Data Annotation Tools (2 among Below List)

i. LabelImg – Image annotation (bounding boxes), widely used in object detection datasets.

ii. CVAT (Computer Vision Annotation Tool) – Powerful, open-source annotation tool developed by Intel; supports image, video, polygons, masks.

iii. Labelme – Simple image annotation tool (polygon, rectangle, circle, line, point).

iv. VoTT (Visual Object Tagging Tool) – Microsoft's annotation tool, supports object detection & classification.

v. Scalabel – For 2D/3D image & video annotation, useful for autonomous driving datasets.

vi. makesense.ai – Free online tool for bounding boxes, keypoints, and segmentation.

vii. SuperAnnotate – End-to-end data annotation with automation.

viii. Label Studio

f. Advance Computer Vision, Deep Learning

    i. **FiftyOne**

        1. Powerful for dataset exploration, visualization, evaluation of models (detection, segmentation, classification).

        2. Works with PyTorch, TensorFlow, Detectron2, YOLO, etc.

    ii. Roboflow

        1. Provides dataset annotation, preprocessing, augmentation, and training pipelines (YOLO, TF, PyTorch).

    iii. **MediaPipe (Google)**

        1. Fast CV pipelines for face, hand, body, gesture, etc.

g. **Edge & Real-Time Vision**

    i. TinyML for object detection on IoT devices.

    ii. **TFLite (TensorFlow Lite)**: Optimized deep learning for mobile and edge (NNAPI, CoreML).

    iii. **PyTorch Mobile & ExecuTorch** → PyTorch models optimized for mobile/edge inference.

    iv. **EdgeImpulse** → No-code/low-code ML deployment to microcontrollers & edge devices.

    v. **Pruning & Quantization Toolkits** (PyTorch FX, TFLite Quantization, HuggingFace Optimum).

    vi. One or Two Case Studies on Below Dataset

        1. **Tiny-ImageNet** → Edge-scale ImageNet variant.

        2. **EdgeCases** (custom small object datasets, e.g., drones, mobile).

        3. **KITTI Dataset** → Real-time autonomous driving benchmarks.

        4. **Waymo Open Dataset** → Self-driving, optimized for latency tests.

        5. **VisDrone** → Drone-based real-time detection/tracking.

        6. **MOTChallenge** → Multi-object tracking benchmark.

        7. **WIDER FACE** → Robust face detection under real-world constraints.

  h. Hugging Face - In Detail

    i. **Transformers** – Pretrained models (NLP, CV, Speech, Multimodal).

    ii. **Datasets** – Community datasets with streaming, efficient loaders.

    iii. **Tokenizers** – Fast tokenization for large-scale models.

    iv. **Evaluate** – Standardized metrics library.

    v. **Diffusers** – Stable Diffusion & generative model pipelines.

    vi. Hugging Face Spaces (Deployment Playground)

    vii. Model Building and Model Hosting on HuggingFace

  i. 20+ Case Studies / Projects across Above Topics

2. NLP & AI Bot

  a. NLP Foundation & Text Processing

  b. **Text Understanding & Representation**

    i. Text Classification → Spam detection, sentiment analysis, topic categorization

    ii. Intent Detection → Identify user intent in chatbot queries

    iii. Named Entity Recognition (NER) → Extract people, places, dates, organizations

    iv. Part-of-Speech (POS) Tagging → Grammar structure understanding

     v. Semantic Similarity → Matching FAQs, duplicate question detection

     vi. Embedding: Text Embedding & Representation → Word2Vec, BERT embeddings

  c. Conversational AI & Bots

  d. Information Retrieval & Summarization

  e. Sentiment, Opinion & Social Media NLP

  f. Dialogue & Context Handling

  g. **Speech & Multimodal NLP**

     i. Speech-to-Text → Transcription (e.g., meetings, lectures)

     ii. Text-to-Speech → Voice assistants, audiobook generation

     iii. Multimodal Bots → Text + Image + Voice inputs (e.g., "Upload bill & ask insurance query")

     iv. Video Captioning & Description Bots

  h. Audio - Text , Video to Text Summarization, Language Translation, Etc

  i. 20+ Case Studies / Projects across Above Topics

     i. ML, RNN, Transformer and HuggingFace Based

3. **Project Demo: Monthly - Online or Offline (College - Need to Conduct)** - On Topics Covered. Exact Dates will be announced later

  a. Either Team or Individual - All Projects should be different in either Problem Statement or tool/libraries or datasets or domain

  b. Problem statements - Should be selected from our list or students can propose themselves

  c. Presentation Template, Project Report Template will Be share

  d. Project Evaluation - Peer Evaluation and Faculty Evaluation will Be shared

4. Hackathon - 3

  a. Online Hackathon/Participate Hackathon Suggested - Problem Statements will be given and Final Demo - Online

5. **Final Year Project**

  a. Students will Select Topic & Students only develop

  b. PragyanAI mentor as External Guide

6. **Research Paper - 2 / Internship (At any Company if Students Selected by company from college)**

  a. Team of 2-4 Students with One College Faculty - Topics provided by us

       i.   Students have to work in collaboration with Faculty

       ii.   PragyanAI will be One Author and PragyanAI will not pay paper publication Fee

7. Evaluation

    a. Assignments

       i.   Coding & Project Based

       ii.   MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)

    b. Exam

       i.   Project Challenge - Need to Submit - in 2-3 Weeks

8th Semester

(Topics Covered during Online and Offline Sessions - Detailed Curriculum with Project /Case Studies will be shared before semester Start):

1. Generative AI – Foundation & Applications

    a. GenAI, LLM, MLLM, SLM, VLM etc

    b. Applications across domains

    c. Ethical concerns

    d. Playground and Platforms

2. Large Language Models (LLMs)

    a. Transformer Architecture (Attention, Self-Attention, Multi-Head Attention)

    b. Pretrained LLMs: GPT, LLaMA, Falcon, Mistral, Claude, Gemini

    c. Fine-Tuning: Full fine-tuning, LoRA, PEFT, Parameter-efficient tuning

    d. RAG (Retrieval Augmented Generation) – grounding responses in external data

    e. LLMOps – monitoring, evaluation, cost optimization

3. Prompt Engineering

    a. Basics: Zero-shot, Few-shot, Chain-of-Thought prompting

    b. Advanced: Self-consistency, Tree-of-thoughts, ReAct prompting

    c. Role prompting: System vs. User vs. Assistant instructions

    d. Guardrails: Safety prompts, bias reduction, hallucination control

    e. Prompt compression & token optimization

f. Tools: LangChain PromptTemplates, Guidance, DSPy, LLAMA Index, Groq, COHERE, FIREWORKs
g. Domain Specific Prompting : Marketing, Coding (ML Model, End To End), Debugging, VIBE Coding In Depth

4. **Agentic AI (AI Agents)**
   a. Components: Perception (sensing), Reasoning, Memory, Action
   b. Tools: LangChain, LlamaIndex, CrewAI, AutoGPT, BabyAGI
   c. Agent memory: short-term vs. long-term memory
   d. Action execution: API calls, web browsing, tool usage
   e. Guardrails & safety in autonomous agents

5. **Multi-Agentic AI**
   a. Multi-agent systems: Cooperation, competition, negotiation
   b. Orchestrators: Centralized vs. Decentralized coordination
   c. Human-in-the-loop in multi-agent frameworks

   d. Multi-agent reinforcement learning (MARL)
   e. Applications: Simulation, strategy, business workflows, gaming, governance
   f. Frameworks: CrewAI, AutoGen, Swarm, Hugging Face AutoTrain + Agents

6. **MCP – Model Context Protocol**
   a. Anthropic MCP SDK
   b. LlamaIndex / LangChain MCP bridges
   c. Integration with Hugging Face Spaces
   d. Wrap SQLite, Google Sheets API, and Hugging Face datasets.
   e. SQLite/Postgres with MCP

7. **Applications & Case Studies**
   a. Multi-source RAG Pipelines (Docs + DB + API)
   b. Research Agent: Summarizes latest scientific papers + cross-references sources
   c. Business Agent: Automates meeting scheduling, note-taking, follow-ups
   d. Data Analyst Agent: Reads CSV, runs ML model, generates dashboards automatically

e. Ops Agent: Monitors logs, detects anomalies, alerts humans
f. Learning Agent: Adapts to student progress & modifies curriculum
g. Multi-Agent Tutoring System – Teacher agent, quiz agent, evaluator agent
h. Customer Service Hub – Billing agent, technical support agent, escalation agent
i. Healthcare Assistant – Diagnosis agent, treatment planning agent, medical compliance agent
j. Supply Chain Simulation – Buyer agent, supplier agent, logistics agent
k. Smart Cities – Traffic agent, energy management agent, pollution monitoring agent

8. **Module: AI-Powered MVP Development & Deployment**
   a. **Foundations of MVP & Prototyping**
      i. What is an MVP? (Minimum Viable Product vs. Prototype vs. POC)
      ii. Design Thinking & Lean Startup Methodology
      iii. Rapid Idea Validation: Problem → Solution Fit → Market Fit
      iv. Agile & Iterative Development Mindset
   b. **Project Management & Collaboration Skills**
      i. Agile Project Management (Scrum, Kanban for MVPs)
      ii. Tools: Trello, Jira, Notion, GitHub Projects
      iii. Timeboxing & Sprint Planning for Fast Prototyping
      iv. Cross-functional teamwork: Design, Dev, AI/ML, Business
   c. **Design Thinking for MVPs**
      i. User Research & Persona Building
      ii. Customer Journey Mapping
      iii. Wireframing & Low-Fidelity Prototyping (Figma, Miro)
      iv. UX/UI for AI-powered Applications
   d. **AI Integration in MVPs**
      i. Identifying where AI adds value in MVPs
      ii. Using Pre-trained Models (Hugging Face, OpenAI, Google Vertex AI)
      iii. Building AI-driven features:
         1. NLP Bots
         2. Computer Vision modules

      3. Recommendation Engines

      4. Predictive Analytics

e. **Web & Mobile App Development with AI Tools**

    i. Instead of traditional full-stack → leverage AI & no-code/low-code tools.

    ii. **Tools Showcase (one or two Tools in The list Depends on Case studies/project Selected):**

      1. Rocket – AI-first app builder

      2. Replit – collaborative AI-assisted coding

      3. WebFlow – no-code websites

      4. Relume – Figma-to-React/Webflow

      5. Firebase Studio – AI-powered Firebase setup

      6. Glide – no-code mobile/web apps

      7. Thunkable – drag-and-drop mobile app builder

      8. FlutterFlow – Flutter-powered no-code mobile app builder

      9. Adalo – app prototyping

      10. Cursor – AI coding IDE

f. Prototyping Fast

    i. **Setting the Stage**

      1. Shift in developer skillset → From Full Stack → AI Solution Designer

      2. Tools showcase (Rocket, Replit, FlutterFlow, Glide, Hugging Face, Firebase)

      3. Mini Exercise → Each team picks frontend + backend AI toolstack

    ii. **Build the MVP**

      1. Frontend MVP: FlutterFlow / Thunkable / Glide / Rocket

      2. Import Figma / prompt-based UI generation

      3. Backend MVP: Flask/FastAPI + AI model + Firebase hosting

      4. Mini Project → AI-powered MVP (basic UI + connected AI API)

g. **Deployment & Scaling MVPs**

    i.   Deployment on Hugging Face Spaces, Streamlit Cloud, Vercel, Netlify

    ii.   **Integration**

        1. Connect frontend with backend (REST API, Firebase, Webhooks)

        2. LangChain / LlamaIndex for RAG

        3. Mini Exercise → Teams integrate frontend app with AI backend

    iii.   Deployment & Publishing

        1. WebApp: Hugging Face Spaces, Streamlit Cloud, WebFlow, Firebase

        2. Mobile App: FlutterFlow/Thunkable APK build → local test

        3. GitHub/Firebase for collaboration

        4. Mini Exercise → Deploy & share app link/APK

    iv.   Handling feedback loops → Updating MVP iteratively

  h. **Case Studies & Hands-on Projects**

    i.   AI Chatbot MVP for EdTech (Streamlit + Hugging Face + Firebase)

    ii.   Computer Vision MVP for Healthcare (Colab + FastAPI + Streamlit)

    iii.   Personal Finance Mobile App with AI-powered Insights (React Native + OpenAI API)

    iv.   Multi-Agent AI Tutor MVP (LangChain/Agents + Gradio)

9. Real World Project - Quick MVP Development / Internship at Companies (if Students Get Selected at Company)

  a. 2-3 Live Projects

10. **Project Demo: Monthly - Online or Offline (College - Need to Conduct)** - On Topics Covered. Exact Dates will be announced later

  a. Either Team or Individual - All Projects should be different in either Problem Statement or tool/libraries or datasets or domain

  b. Problem statements - Should be selected from our list or students can propose themselves

  c. Presentation Template, Project Report Template will Be share

  d. Project Evaluation - Peer Evaluation and Faculty Evaluation will Be shared

11. **Hackathon - 4**

a. Online Hackathon/Participate Hackathon Suggested - Problem Statements will be given and Final Demo - Online

12. **Research Paper - 3**
    a. Team of 2-4 Students with One College Faculty - Topics provided by us
        i. Students have to work in collaboration with Faculty
        ii. PragyanAI will be One Author and PragyanAI will not pay paper publication Fee

13. **Mock Interviews - Tech, HR and GD**
14. **Career Mentorship - How to Crack Interviews**
15. **Profile Building - Resume, Linkedin, Github**
16. **DSA & Core CSE Concepts Refresh (2 Weeks - Online Complementary)**
17. **Aptitude and SoftSkill (2 Weeks - Online - Complementary)**
18. **Evaluation**
    a. Assignments
        i. Coding & Project Based
        ii. MCQ & Key Concept(Subjective) - Video (Clips - Explaining Concept - Self Recorded)
    b. Exam
        i. Project Challenge - Need to Submit - in 2-3 Weeks
19. **Placement Drive - Starts - Completes with All Placed**

Placement

final placements would look like for this track:

Program is Equivalent to M.Tech in AIML from IIT/NIT - In term curriculum depth and hands on

PragyanAI's Master's Certificate Program (MCP) is positioned as equivalent to an M.Tech in AIML from an IIT or NIT based on its intensive curriculum covering a broad range of subjects, extensive hands-on training, experienced faculty, and a significant number of learning hours that parallel a traditional master's degree.

Curriculum Intensity & Subject Coverage

The program's structure is designed for depth, covering a wide array of topics that can be equated to 12-15 traditional subjects. The curriculum is broken down into

8 key skill areas, which progress from foundational to highly advanced concepts.

- Skill 1: Python Full Stack & Data Processing/Data Wrangling
- Skill 2: Data Science Foundation & Advance Data Wrangling
- Skill 3: BI / Data Analytics
- Skill 4: Machine Learning (including Advanced ML)
- Skill 5: Deep Learning & Computer Vision (including Advanced DL)
- Skill 6: NLP & AI Bot
- Skill 7: Generative AI
- Skill 8: Agentic AI

Extensive Hands-on Training & Tools

A core component of the program is its emphasis on practical, hands-on application, which ensures students build a robust portfolio.

- Total Learning Hours: The program involves over 1500+ hours of learning, which includes more than 550 offline hours and additional live online sessions. This is comparable to the time commitment of a full-time M.Tech program.
- Project-Heavy Structure: It features over 100+ projects and 2-3 real-world capstone projects.
- Vast Tooling: Students gain proficiency in over 50+ AI tools and libraries.
- Materials and Infrastructure: The program provides essential resources like presentation and project report templates and utilizes industry-standard platforms like Google Colab and Kaggle NoteBook.

Faculty Experience & Pedagogy

The program is delivered by highly experienced faculty using a pedagogy designed for deep, practical learning.

- Expert Faculty: The lead trainer possesses over 25 years of combined industry, academic, and research experience. Their background includes developing commercial products, guiding startups in GenAI, and helping develop AI curricula for institutions like Wharton University.
- 10X Pedagogy: The teaching method is described as a "Live-to-Practice Pipeline". This approach ensures that theoretical knowledge is immediately applied through hands-on labs, frequent hackathons, and prototype development, mirroring real-world industry expectations.
- Proven Track Record: PragyanAI has a history of training over 4000 individuals through more than 200 workshops and has experience teaching a diverse range of learners, from school students to working professionals and college faculties

GNDEC + PragyanAI: The Edge for an Elite AI Career

This program is meticulously designed to transform you into a top-tier AI professional, ensuring you not only outperform your peers but also secure a significantly higher starting compensation. It's about building an **AI-first mindset** and the **practical skills** that employers are desperately seeking.

Why GNDEC + PragyanAI Graduates Stand Out

Our program closes the gap between traditional academics and industry demands, fostering a new breed of AI talent.

- **Beyond Theoretical Knowledge:** We dive deep into cutting-edge AI technologies and practical implementations, unlike conventional curricula that often remain abstract.
- **Industry-Ready Portfolio:** You'll build a vast and impressive body of work, making you an undeniable candidate for top roles.
- **Accelerated Career Growth:** Our focus on in-demand skills and career preparation ensures you hit the ground running, commanding a premium in the job market.

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The Unbeatable Advantage: Skills & Compensation

Feature Area	Traditional College Graduate	**GNDEC** + PragyanAI Graduate	Impact & Why You Get ₹50K+ More CTC
Curriculum & Scope	Foundational AI/ML, often broad theory. Limited exposure to latest GenAI/Agentic AI concepts.	Hyper-Focused & Cutting-Edge: Covers 8 core skill areas including GenAI, AgenticAI, LLMs, MLOps, AI Product Development. Equivalent to 12-15 advanced subjects.	Future-Proof Skills: You master technologies that are just emerging in the industry, making you instantly valuable for advanced roles, not just entry-level. This foresight directly translates into higher initial offers.
Hands-on Experience & Projects	Typically 1-2 major projects, mainly academic. Limited real-world problem-solving.	Massive Practical Portfolio: Over 100+ projects, 2-3 real-world Capstone Projects, 4 Hackathons, 3 Research Papers.	Proof of Capability: Employers don't just hear about your skills; they see them in your extensive portfolio. This reduces hiring risk for companies, allowing them to offer higher salaries for proven talent.

Tools & Infrastructure	Basic ML libraries, often without deployment focus.	50+ Industry-Standard AI Tools & Libraries: Extensive use of TensorFlow, PyTorch, Hugging Face, Streamlit, Gradio, Tableau, PowerBI, MLOps platforms.	Immediate Productivity: You're ready to contribute from day one using the tools the industry demands. Less ramp-up time for the company means you're worth more.
Learning Hours & Intensity	Standard academic hours (classroom + self-study).	1200+ Hours of Intensive Learning: Over 550+ dedicated offline hours + extensive online live sessions.	Deep Mastery: This concentrated effort ensures a level of practical mastery and problem-solving intuition that a less intensive program cannot provide. Your depth of understanding is reflected in your compensation.

Faculty & Pedagogy	Academics with theoretical strength.	25+ Years Industry Veteran as Trainer: Led by an expert who developed products, guided startups, and built Wharton's AI curriculum."Live-to-Practice Pipeline" methodology.	Real-World Mentorship: Learning from someone who has built and shipped AI products ensures practical relevance. The hands-on, outcome-driven teaching immediately prepares you for industry challenges, elevating your market value.
Career Outcomes & Support	Generic placement support.	Dedicated Career Mentorship: Mock interviews (Tech, HR, GD), Resume/LinkedIn/Github building, 100% placement assistance. "Impact Assured" Guarantee: Targeted ₹50K-₹1 Lakh higher CTC than peers, with a 50% fee refund if not achieved.	Confidence & Leverage: You're not just skilled; you're coached to articulate your value. The "Impact Assured" guarantee underscores the program's commitment to your financial success, empowering you to negotiate for higher salaries.

The Imperative for Deep AI Skills: Navigating a Shifting Global Landscape

The current environment presents unprecedented challenges for engineering graduates:

● Exploding Intake: The sheer volume of engineering graduates from numerous colleges creates intense competition for quality roles.
● AI-Driven Efficiency: Artificial Intelligence is fundamentally transforming industries, streamlining processes and reducing the number of traditional entry-level positions through automation and increased efficiency.
● Global Mobility Restrictions: Visa restrictions and changing immigration policies in the US and other developed nations are limiting opportunities for Indian engineers abroad, intensifying domestic competition.

In this landscape, generic degrees are no longer sufficient. Specialized, verifiable skills are paramount to securing desirable employment and commanding a premium salary.

GNDEC + PragyanAI: Your Unfair Advantage in the AI Era

The **GNDEC** + PragyanAI Master's Certificate Program (MCP) is engineered precisely to address these challenges. It's not merely an academic add-on; it's a strategic, three-year transformational journey designed for deep skill-building, project immersion, and assured outcomes that directly counter the prevailing market headwinds.

This program goes far beyond typical certifications or short-term courses, offering a distinct edge through:

Target Roles

By the end of the program, students will have moved beyond entry-level positions. They will be qualified for roles such as:

- **AI Specialist / ML Engineer:** Designing, building, and deploying machine learning models for specific business problems.
- **AI Solution Architect:** A key role that involves designing end-to-end AI systems, selecting the right technologies, and ensuring the solution is scalable, reliable, and secure.
- **Data Scientist (Advanced):** Focusing on complex predictive modeling, statistical analysis, and extracting insights from large datasets to drive business decisions.
- **AI Product Manager:** For students who excel in the product management modules, this role involves defining the vision, strategy, and roadmap for AI-powered products.
- **MLOps Engineer:** Specializing in the operational side of machine learning, including automating the deployment, monitoring, and management of ML models in production.

Target Companies

The program's blend of theoretical knowledge and practical, hands-on experience (especially the Year 4 internship and capstone project) makes graduates attractive to a wide range of companies, including:

- **Big Tech (Product-Based Companies):** Google, Microsoft, Amazon, Meta, etc., for roles in their AI research and product divisions.
- **IT Services & Consulting Giants:** Companies like TCS, Infosys, Wipro, Accenture, and Deloitte, for their AI centers of excellence and consulting practices.

- **Global Capability Centers (GCCs):** The R&D and innovation hubs of large multinational corporations (e.g., Target, Walmart Labs, financial institutions) that are heavily investing in AI.
- **High-Growth AI Startups:** Well-funded startups that are building innovative AI products and need skilled engineers and architects to scale their solutions.
- **Domain-Specific Companies:** Businesses in sectors like FinTech, HealthTech, E-commerce, and Manufacturing that are actively hiring AI talent to build specialized solutions.

Why Does This Curriculum Leads to Strong Placements?

- **Practical Experience:** Students graduate with significant, real-world work experience.
- **Strong Portfolio:** The "Projects + Research + Real World Capstone Projects" provides a tangible, complex project that students can showcase to potential employers.
- **Advanced, In-Demand Skills:** The curriculum covers cutting-edge topics like Agentic AI, MLOps, and domain-specific solutions, which are highly sought after in the industry.
- **PragyanAI's Career Support:** The dedicated career prep in the final semester, including mock interviews and resume workshops, ensures students are well-prepared for the hiring process.

Program Comparison

Feature	MCP (3-Year Hybrid Program)	UpGrad (AI/ML Programs)	NxtWave / Masai / Simplilearn (Bootcamps, Job Programs, Certifications)

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Duration & Hours	~36 months; 2000+ hours (550+ offline hours across 6 semesters + 1500+ live online sessions).	Typically 5–18 months; 250–600 hours depending on specialization	Short-term bootcamps (4–9 months) or job-ready crash courses, ~200–400 hours.
Projects & Capstones	150+ projects across all 8 AI domains + 3–5 real-world capstones (research-driven, industry-linked, hackathon-ready).	~10 projects/capstones, plus case studies	Few projects; focus on basic assignments, job-oriented coding tasks; capstone rarely at research/enterprise level.
Delivery Mode	Blended learning: Full-day offline semesters + weekly online sessions + hackathons.	Primarily online; occasional short residencies or immersion weekends.	Mostly online, self-paced or live bootcamps; little or no offline engagement.
Cost Structure	₹60K upfront (₹10K/semester × 6) + income-linked pay-after-placement model. Placement fees based on CTC.	₹1–5 Lakhs upfront, no income-share model .	₹1L-3L bootcamps (Simplilearn, NxtWave, Masai); typically upfront or EMI-based, no income-share refund model.

Placement Guarantees	100% placement guarantee; structured refunds if not placed within 6 months post-program. Built-in mock interviews, projects, hackathons.	No formal refund/guarantee; some student reports raise concerns about actual placement outcomes .	Mixed results; some "placement assistance" offered but outcomes vary widely; mostly transparent only up to job interview support.
Risk Mitigation	Refund after semester 3 if a student opts out; pay-after-placement ensures fairness and shared risk.	No refund or opt-out after payment. Risk borne entirely by students.	No refunds; some with steep penalties for withdrawals.
Institutional Benefits	Designed for college integration: Faculty engagement, joint research, final-year projects, hackathons, student showcases.	Minimal institutional collaboration; focus on individual learners only.	Very limited institutional integration; focus on direct-to-student skilling.
Skill Coverage	Full stack Python, ML/DL, NLP, CV, Generative AI, Agentic AI, MCP integration, deployment, research exposure.	Strong coverage of ML/DL & data science; limited Generative AI/Agentic AI depth.	Mostly coding, ML basics, and placement-ready interview prep.

Unique Edge	Hybrid + affordable + placement-backed + research + 3-year deep journey.	Good for working professionals, short timeline.	Quick, job-focused; not comprehensive.

Why Should a College Engage in This Partnership?

Engaging with this program allows a college to leapfrog traditional education models and become a leader in AI. The key benefits are:

- **Elite Branding & Student Attraction:** Partnering with an AI industry leader like PragyanAI instantly elevates the college's brand, making it a top destination for high-caliber students who want a future-proof education.
- **Drastically Improved Placement Outcomes:** The job-focused track, with its mandatory internship and direct industry connections, is designed to secure graduates premium roles at top tech companies, significantly boosting placement statistics.
- **Boosted Research & Innovation Profile:** The AI Scholar track and the collaborative support ecosystem will increase the volume and quality of research papers, patents, and grant-funded projects, enhancing the institution's academic reputation.
- **Creation of a Self-Sustaining Ecosystem:** The program fosters a vibrant ecosystem on campus. The AI support hub helps faculty win grants, the startup track spins off new companies, and successful alumni create a powerful network, bringing long-term value back to the college.

Benefits to Students

1. **Affordable, Low Initial Investment**: Start with ₹60K and pay the rest only after placement — reduces financial stress.
2. **Deep Domain Coverage**: From core Python Full Stack to advanced Agentic AI and MCP — rare breadth in a single program.

3. **Live-to-Practice Pipeline**: Live sessions, hands-on tools, frequent hackathons, real prototypes aligned with industry expectations.
4. **Outcome and Accountability Focus**: Placement-linked pay model aligns incentives for both students and the provider.
5. **Research & Publication Opportunities**: Built-in academic value through capstones, research papers co-authored with faculty.

Why Learn from PragyanAI?

PragyanAI - has been in training for the last 6 Years. Conducted More than 200+ workshops, Several Batches Passed out. Overall 4000+ People trained on various Course

Trainer is 25+ Industry + academic + research Experience. Developed Several Products, technically guiding several startups to develop GenAI, Agentic AI solutions. Conducted Several hackathons, Mentored startups, Jury at several hackathons. Conducted Several Faculty Development Programs. KeyNote Speaker at several AI Summits. Developed 1000+ Case Studies. Helped Developing Curriculum for various universities - including Wharton University for Executive AI program for working professionals. Written 20+ Research papers, and filed patents.

Research Experience + Innovation Experience + Product Development Experience + Training Experience (Several GenAI + AI Agentic batch/bootcamp completion experience along with Data Science, Machine Learning, Deep Learning, NLP, AI Bot Training experience. Experience of training - Engineering Students, Non Engineering Students, Working Professionals, Faculties of College, Students from 8th Std to 12th Std.)

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Final Takeaway:

Master's Certificate Program (MCP) is **not just another certification** — it's a **three-year transformational journey** designed for deep skill-building, project immersion, and assured outcomes. Unlike other programs that may deliver short-term content and uncertain placements, MCP delivers:

- **Intense academic rigor**
- **Robust, outcome-based finance model**
- **Institutional participation and research alignment**
- **Market-leading tech depth across 8 AI domains**

Your college and students gain **sustained capability-building, placement success, and a future-ready AI ecosystem**.