



D R E A M S O V E R D E G R E E S
presents

EVOLVE Plus

AI in Healthcare

Comprehensive Programme Syllabus

Commencing
1st Week of April 2025

Schedule
Every Sat & Sun | 6:00 PM IST

12

Live Sessions

6

Weeks Programme

4

Major Assignments

Lead Instructor

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1. About the Programme

EVOLVE Plus is an advanced, comprehensive live programme designed for healthcare professionals, students, and researchers who want to go beyond awareness and actually build AI solutions in healthcare. No engineering background required.

Healthcare is being transformed by Artificial Intelligence — and the professionals who will lead that transformation are the ones who understand it from the inside. EVOLVE Plus is designed by clinicians and engineers, taught by IIT Hyderabad alumni, and built specifically for people who know medicine but are new to AI.

This is not a theoretical programme. By Session 12, every student will have built real AI projects — a machine learning model on healthcare data, a deep learning image classifier on medical images, an NLP pipeline on clinical text, and a healthcare startup pitch deck — all documented and ready for their portfolio.

Programme Objectives

- Build a complete conceptual and practical understanding of AI, ML, and Deep Learning from scratch
- Apply Python and data science tools directly to real healthcare datasets in Google Colab
- Understand how medical imaging AI, NLP, and LLMs work — and where they fit in clinical practice
- Conduct AI-assisted academic research using tools like LitMap, Consensus, and Elicit
- Design, build, and present a healthcare startup pitch to real judges on Demo Day
- Produce a portfolio of 4 real AI project notebooks, a pitch deck, and an updated LinkedIn profile

Who Should Enrol

Ideal Candidates

- MBBS, BDS, BAMS, BHMS, BPT graduates
- Medical and dental postgraduates (MD, MS, MDS)
- Allied health professionals (nurses, physiotherapists, radiographers)
- Healthcare students in final or penultimate year
- EVOLVE 1 alumni looking to go deeper
- Researchers and academics in medical sciences

No Prior Experience Needed In

- Programming or coding
- Mathematics or statistics
- Machine learning or AI
- Data science or engineering

Only prerequisite: a laptop, a Google account, and genuine curiosity.

2. Programme Details

Start Date	1st Week of April 2025	Schedule	Every Saturday & Sunday
Session Time	6:00 PM – 8:00 PM IST	Duration	6 Weeks (12 Sessions)
Mode	Live Online (Zoom / Google Meet)	Session Length	1.5 to 2 hours per session
Platform	Google Classroom (assignments)	Certificate	Yes — verifiable online at dreamsoverdegrees.com
Recordings	Yes — all sessions recorded and shared	Doubt Sessions	Yes — dedicated revision & doubt clearing
Guest Lectures	Yes — UK doctor (foreign opportunities) + AI founders	Max Batch Size	Cohort-based, limited seats

Session Schedule — April 2025 Cohort

Week	Saturday Date	Sunday Date	Session Nos.	Topic Area
Week 1	5 Apr	6 Apr	Sessions 1–2	Python, Data & EDA
Week 2	12 Apr	13 Apr	Sessions 3–4	Statistics & ML Basics
Week 3	19 Apr	20 Apr	Sessions 5–6	ML Deep Dive & Neural Networks
Week 4	26 Apr	27 Apr	Sessions 7–8	DL Imaging & NLP / LLMs
Week 5	3 May	4 May	Sessions 9–10	Research Tools & Career
Week 6	10 May	11 May	Sessions 11–12	Startup Pitch & Demo Day

All sessions are held at 6:00 PM IST sharp. Late joiners will be accommodated but recordings will be made available within 24 hours for students who miss a session. Students are expected to attend at least 80% of live sessions to qualify for the completion certificate.

3. Full Curriculum — Session by Session

The programme is structured as a progressive learning journey — from absolute basics to advanced AI applications. Each session builds directly on the previous one. No session can be understood without the foundation laid before it.

WEEK 1	Python, Data Analysis & Statistics	5–6 Apr 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S01	Programme Orientation & Python Basics <i>Saturday, 5 April 2025</i>	AI family tree, ML/DL/NLP overview, what is prompting, Colab setup, Python variables, print, data types, reading errors	2 hrs
S02	Data Analysis with NumPy, Pandas, Matplotlib & Seaborn <i>Sunday, 6 April 2025</i>	Library overview, loading CSV, head/describe/isnull, data cleaning, histogram, bar chart, boxplot, scatter, pairplot — full EDA pipeline	2 hrs

Session 01 — Detailed Outline

- Welcome to EVOLVE Plus: instructors, programme philosophy, Demo Day preview
- The AI landscape: AI → ML → DL → NLP → Computer Vision — visual family tree
- Where healthcare AI stands today: Qure.ai, Niramai, Tricog Health — real Indian examples
- Programme roadmap: what each of the 12 sessions will cover and why
- Prompt engineering essentials: what is a prompt, the Role-Context-Task-Format framework (2 slides, live demo)
- Google Colab orientation: cells, running code, connecting to Drive, saving notebooks
- Python basics: variables, data types, arithmetic, print statements, comments
- How to read an error message and how to use Claude/ChatGPT as a coding assistant
- Hands-on: students write their first notebook — 10 lines of Python, use Claude to fix a deliberate error

Session 02 — Detailed Outline

- Library orientation: NumPy (the calculator), Pandas (the spreadsheet), Matplotlib (drawing tool), Seaborn (statistical charts)
- The 4-line import block students will use every session from this point forward
- Pandas: read_csv, head(), shape, describe(), isnull().sum(), fillna(), groupby()
- Clinical EDA: glucose of 0 — is that real? Identifying and handling impossible values
- Matplotlib: plt.hist(), plt.bar(), plt.show(), adding titles, labels, colours
- Seaborn: sns.histplot(), sns.boxplot(), sns.scatterplot(), sns.pairplot(), sns.heatmap()
- Live project: Pima Indians Diabetes Dataset — load, clean, produce 5 charts, interpret clinically
- Mini solo project: students clean and visualise the Heart Disease dataset independently

WEEK 2	Statistics & Machine Learning Foundations	12–13 Apr 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S03	Statistics for Healthcare Research <i>Saturday, 12 April 2025</i>	Mean, SD, hypothesis testing, t-test, chi-square, p-value, correlation, heatmap — full research-grade EDA report in Python	2 hrs
S04	Introduction to Machine Learning <i>Sunday, 13 April 2025</i>	Supervised vs unsupervised vs reinforcement learning, features & labels, train/test split, overfitting, K-Means clustering, PCA, Scikit-learn intro	2 hrs

Session 03 — Detailed Outline

- Why statistics matters: the difference between data and evidence
- Descriptive statistics: mean, median, mode, range, standard deviation — with patient BP data
- What is a hypothesis: null hypothesis explained without jargon
- t-test in Python: comparing glucose between diabetic and non-diabetic patients (SciPy)
- Chi-square test: comparing categorical outcomes — smoker vs non-smoker survival
- P-value demystified: what $p < 0.05$ actually means for a clinician, and what it does not mean
- Pearson correlation: does age correlate with blood pressure? Running and interpreting in Python
- Correlation heatmap: reading a heatmap as a clinical finding
- Building a complete EDA report: the kind attached to a research paper — live build in Colab

Session 04 — Detailed Outline

- What is machine learning: the doctor analogy — experience builds pattern recognition
- Supervised learning: labelled data, classification vs regression — clinical examples
- Unsupervised learning: finding patterns without labels — patient clustering
- Reinforcement learning: brief introduction with drug dosing and surgical robot examples
- Features and labels: blood pressure/age as features, diagnosis as label
- Train-test split: why we hold out data and what happens if we don't
- Overfitting: the memorisation problem — why 99% accuracy can be dangerous
- K-Means clustering: grouping patients by similarity, choosing K, interpreting clusters clinically
- PCA: reducing many variables to the most important ones — visualising in 2D
- Hands-on: K-Means and PCA on diabetes dataset — students interpret clusters as a clinician

WEEK 3	Supervised ML Deep Dive & Neural Networks	19–20 Apr 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S05	Supervised ML — Classification & Model Comparison <i>Saturday, 19 April 2025</i>	Logistic regression, Decision Tree, Random Forest, SVM, accuracy/AUC/ROC, confusion matrix, feature importance, cross-validation	2 hrs
S06	Neural Networks & Deep Learning Foundations <i>Sunday, 20 April 2025</i>	Neurons, layers, activation functions, backpropagation intuition, loss function, epochs, Keras/TensorFlow, first DL model on clinical data	2 hrs

Session 05 — Detailed Outline

- Classification vs regression: predicting a category vs predicting a number
- Logistic regression: predicting probability of disease on a 0–1 scale
- Decision Tree: the flowchart model — how it makes branching decisions
- Random Forest: why many trees beat one tree — ensemble learning intuition
- SVM: drawing the optimal boundary between sick and healthy patients
- When to use which model: a practical guide for common healthcare data scenarios
- Accuracy, precision, recall, F1: what each number means clinically — false negatives can kill
- Confusion matrix: true positive, false positive, true negative, false negative in patient terms
- ROC curve and AUC: the gold standard metric for clinical prediction models
- Feature importance: which patient variables matter most — does it make clinical sense?
- Hands-on: train 3 models on heart disease data, compare AUC, discuss clinical implications

Session 06 — Detailed Outline

- What is a neural network: neurons, layers, connections — the brain analogy
- Input layer, hidden layers, output layer: what each does in plain clinical terms
- Activation functions: why ReLU is like a light switch that decides what signal passes
- Backpropagation: learning from mistakes — no mathematics, just the concept
- Loss function: how the model knows it is wrong and by how much
- Epochs and batch size: how long and how much data the model trains on each round
- When deep learning beats classical ML — and the many situations when it does not
- Introduction to Keras and TensorFlow: building a sequential model in 10 lines
- Hands-on: build first Keras neural network on clinical tabular data, watch loss decrease, compare AUC against Session 05 best ML model

WEEK 4	Computer Vision, Medical Imaging, NLP & LLMs	26–27 Apr 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S07	CNNs, Medical Imaging & Data Annotation <i>Saturday, 26 April 2025</i>	Computer vision, CNNs, transfer learning, chest X-ray AI, Roboflow annotation, Label Studio, ethics of imaging AI	2 hrs
S08	NLP, LSTM, Transformers & LLMs in Healthcare <i>Sunday, 27 April 2025</i>	Tokenisation, LSTM, attention mechanism, transformers, LLMs (GPT/Claude/Gemini), Hugging Face, clinical NLP use cases, fine-tuning concept	2 hrs

Session 07 — Detailed Outline

- What is computer vision: how AI sees an X-ray, MRI, or dermatology image
- What is a CNN: filters and feature maps explained visually — no mathematics
- Transfer learning: using a pre-trained model like ResNet as a starting point (senior radiologist analogy)
- Real healthcare imaging AI: radiology, pathology slides, dental OPGs, fundus photography, dermatology
- What is data annotation: bounding boxes, segmentation masks, classification labels
- Label Studio: open-source annotation platform — live demo of a healthcare annotation pipeline
- Roboflow: annotating and exporting medical image datasets for training — full live demo
- Ethics of medical imaging AI: dataset bias, false negatives, regulatory approval (FDA, CE marking)
- Hands-on: run pre-trained chest X-ray CNN predictions in Colab, annotate 5 images in Roboflow

Session 08 — Detailed Outline

- What is NLP: AI that reads doctor notes, discharge summaries, prescriptions, clinical trials
- Tokenisation: how AI breaks a sentence into pieces it can process
- What is an LSTM: remembering sequences — reading a sentence word by word
- Why LSTMs struggled: the long-range forgetting problem with clinical text
- Transformers: how the attention mechanism solved what LSTM could not
- What is a Large Language Model: GPT, Claude, Gemini explained simply and accurately
- Hugging Face: the library that makes LLMs accessible in 3 lines of code
- Fine-tuning concept: teaching an existing model new clinical knowledge without retraining from scratch
- Real clinical NLP: ICD coding automation, symptom extraction, discharge summary generation
- Hands-on: run Hugging Face medical text classifier and summarisation pipeline in Colab

WEEK 5	Research Tools, Career Building & Startup Ideation	3–4 May 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S09	AI for Academic Research & Statistical Reporting <i>Saturday, 3 May 2025</i>	LitMap, Consensus AI, Elicit, Semantic Scholar, LLM-assisted methodology writing, p-value reporting, results section structure	1.5 hrs
S10	Career in Healthcare AI — Resume, LinkedIn & Portfolio <i>Sunday, 4 May 2025</i>	AI career map, non-coding and hybrid roles, resume tailoring, LinkedIn optimisation, GitHub portfolio, how to approach labs and startups	1.5 hrs

Session 09 — Detailed Outline

- The research problem: how long traditional literature review takes vs AI-assisted review
- LitMap: building a visual map of a research field, identifying gaps and key papers
- Consensus AI: asking evidence-based research questions, reading structured answers
- Elicit: extracting structured data from papers — study design, sample size, outcomes
- Semantic Scholar: citation networks, paper discovery, author tracking
- Using Claude/ChatGPT to summarise papers and draft methodology sections ethically
- Statistical reporting for academic papers: p-value, confidence intervals, effect size — what to report and how
- Live demo: instructor builds a LitMap on a healthcare AI topic, queries Consensus, extracts from 3 papers in real time
- Hands-on: students replicate the workflow on their own research topic

Session 10 — Detailed Outline

- Career landscape: roles at the intersection of healthcare and AI — India and globally
- Non-coding roles: clinical AI consultant, medical data annotator, AI product manager, regulatory affairs
- Hybrid roles: healthcare AI researcher, medical writer for AI companies, startup co-founder
- Resume strategy: presenting AI skills as a healthcare professional — what to include and what to remove
- Portfolio building: sharing Colab notebooks on GitHub, linking on LinkedIn, writing project descriptions
- LinkedIn profile optimisation: About section, skills endorsements, Featured section for projects
- How to approach research labs, hospitals, and health tech startups for collaboration or roles
- Guest Speaker: UK-based healthcare AI professional — foreign opportunities, NHS AI landscape, how to apply from India
- Hands-on: draft LinkedIn About section using Claude, peer review in session

WEEK 6	Healthcare Startup, Demo Day & Graduation	10–11 May 2025 6:00 PM IST
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Session	Title	Key Topics	Duration
S11	Healthcare Startup — Ideation, Pitch & Live Practice <i>Saturday, 10 May 2025</i>	Startup types, problem-solution-value framework, Business Model Canvas, DST/BIRAC/Startup India grants, pitch deck anatomy, live 2-min pitch practice	2 hrs
S12	DEMO DAY — Project Showcase & Startup Pitch Finals <i>Sunday, 11 May 2025</i>	Project demos (2 min each), startup pitch finals (3 min each), guest judges, peer feedback, certificate ceremony, EVOLVE Pro teaser	2 hrs

Session 11 — Detailed Outline

- What makes a healthcare startup different: regulation, clinical validation, trust
- How clinicians identify real pain points that engineers and entrepreneurs miss
- Problem → Solution → Value framework: the core of any fundable pitch
- Business Model Canvas applied to healthcare AI: live 20-minute group exercise
- Indian healthcare startup funding ecosystem: DST, Startup India, BIRAC, T-Hub, IITH incubator
- What investors look for: traction, team, market size, unfair advantage, validation
- Anatomy of a 5-slide pitch deck: Problem, Solution, Market, Team, Ask
- Guest Speaker: healthcare AI founder or early-stage investor — what they wish they knew at the start
- Live pitch practice: every student delivers a 2-minute pitch, structured peer feedback

Session 12 — Demo Day Structure

- Part 1 (45 min): Project demos — each student presents best Colab notebook (2 min): problem, model, result
- Part 2 (45 min): Startup pitch finals — refined 3-minute pitch with completed deck
- Part 3 (20 min): Guest judges (clinician + AI founder) give live feedback on top pitches
- Part 4 (10 min): Certificate ceremony, cohort photo, EVOLVE Pro teaser

4. Assignments & Assessment Framework

Assessment in EVOLVE Plus is portfolio-based — students are evaluated on what they build, not on examinations. All assignments are submitted via Google Classroom and reviewed by the instructors within 5–7 working days. Feedback is provided in writing.

The 4 Major Assignments

Each major assignment corresponds to a core technical domain. Together they form a complete AI portfolio that students can share on LinkedIn and GitHub.

- A1

Major Assignment 1 — Data Analytics & Statistics
 Due: Before Session 04 | Load the provided healthcare dataset. Perform a complete EDA: descriptive statistics table, minimum 3 visualisations, 2 statistical tests (t-test and correlation or chi-square), and a written interpretation of each result as you would in a research paper's results section. Submit Colab notebook + 300-word written summary via Google Classroom.
- A2

Major Assignment 2 — ML Tabular Prediction Model
 Due: Before Session 06 | Choose any healthcare dataset from the provided list (diabetes, cancer, heart disease, liver). Train minimum 3 classification models (Logistic Regression, Random Forest, and one of your choice). Compare using accuracy, AUC, and confusion matrix. Write a 200-word clinical interpretation: which model would you recommend deploying and why? Submit Colab notebook.
- A3

Major Assignment 3 — CNN / Medical Image Model
 Due: Before Session 09 | Using the provided pre-trained CNN notebook (chest X-ray or skin lesion dataset), run predictions on the test set. Report accuracy and show 3 correct + 2 incorrect predictions with your clinical commentary on why the model may have erred. Additionally annotate 10 provided images in Roboflow. Submit: Colab notebook + Roboflow dataset export link.
- A4

Major Assignment 4 — NLP / LLM Clinical Text Model
 Due: Before Session 10 | Using the provided Hugging Face notebook, run a text classification model on 10 clinical sentences you write yourself (covering different symptoms, diagnoses, or patient complaints). Report predictions. Write a 200-word reflection: where would this model be useful in your clinical setting, and where could it fail dangerously? Submit Colab notebook.

Weekly Practice Assignments

In addition to the 4 major assignments, a shorter practice assignment is given after each session. These are lighter tasks — usually a modified notebook or a short written reflection — designed to consolidate what was covered in the session. Practice assignments are graded as complete / incomplete.

Session	Practice Assignment	Submission Type
S01	Write a Python introduction notebook using personal clinical data	Colab notebook link
S02	Add one new chart to the Heart Disease dataset and write a clinical interpretation	Colab notebook link

Session	Practice Assignment	Submission Type
S03	Statistical test on provided dataset — write results as a research paper section	Colab notebook + Google Doc
S04	K-Means clustering — describe 3 patient clusters in plain clinical language	Colab notebook link
S05	Train 3 models, compare ROC curves, write clinical recommendation	Colab notebook link
S06	Compare 1-layer vs 3-layer neural network — plot both loss curves	Colab notebook link
S07	Annotate 10 medical images in Roboflow + commentary on annotation challenges	Roboflow export link
S08	Run Hugging Face pipeline on 5 self-written clinical sentences	Colab notebook link
S09	LitMap literature review on personal research topic — 200-word summary	Google Doc link
S10	Updated LinkedIn URL + 1-page resume draft	LinkedIn URL + PDF
S11	Draft 5-slide pitch deck	Google Slides link
S12	Demo Day — project + pitch presentation	Live presentation

5. Student Support & Learning Infrastructure

Session Recordings

All 12 live sessions will be recorded in full. Recordings are uploaded to Google Classroom within 24 hours of the session ending. Students who miss a live session can watch the recording and submit their practice assignment as normal. Recordings remain accessible for the duration of the programme plus 30 days after Demo Day.

Revision & Doubt Clearing Sessions

Two dedicated Revision and Doubt Clearing sessions are scheduled mid-programme and before Demo Day. These are optional live sessions where students can ask questions, revisit confusing concepts, and get live help on their assignment notebooks.

Session	When	Focus
Revision Session 1	Mid-Week 3 (Weekday evening, TBD)	Python, EDA, statistics, ML concepts — any doubts from Sessions 1–5
Revision Session 2	Mid-Week 5 (Weekday evening, TBD)	DL, NLP, research tools — prep for Demo Day projects and pitch decks

Google Classroom

All assignments, resources, datasets, notebook templates, and recorded sessions are managed through Google Classroom. Students must enrol using their Gmail address. The submission deadlines and feedback are tracked on Classroom. Students receive a grade of Complete / Needs Revision / Outstanding for each submission.

Guest Lectures — Exclusive Perks for EVOLVE Plus Students

UK Doctor — International Healthcare AI Opportunities

- How AI is being deployed in the NHS — real clinical use cases
- Career pathways for Indian doctors and healthcare professionals in UK health tech
- How to get into fellowship programmes, research positions, and health tech startups in the UK
- UKMLA, PLAB, and navigating the UK medical system alongside an AI career
- Live Q&A — students can ask direct questions to a practicing UK clinician

This session is exclusively available to EVOLVE Plus enrolled students as a complimentary perk. Scheduled during Week 5.

Healthcare AI Founders & Practitioners

- Session 10: Career speaker — a practicing healthcare AI professional shares their real journey from clinician to AI practitioner
- Session 11: Startup speaker — a healthcare AI founder or early-stage investor shares what they look for and what they wish they knew

Guest lecture speakers will be announced at least one week before the session. All guest sessions are recorded and shared with enrolled students.

6. Certification

Students who complete EVOLVE Plus will receive a Certificate of Completion issued by Dreams Over Degrees. The certificate recognises completion of a 12-session, 6-week advanced programme in AI in Healthcare, including hands-on projects in machine learning, deep learning, NLP, and healthcare AI tools.

Certificate Requirements

- Minimum 80% session attendance (live or recorded)
- Submission of all 4 major assignments
- Participation in Demo Day (Session 12)
- Submission of final project notebook and pitch deck

Online Certificate Verification

All certificates issued by Dreams Over Degrees carry a unique verification code. Employers, universities, and research institutions can verify authenticity online at:

www.dreamsoverdegrees.com

Certificate Verification Portal

7. Contact & Enrolment

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EVOLVE your skills. EMPOWER your career.

This syllabus document is prepared by the academic team of Dreams Over Degrees. Content, session structure, and guest speakers are subject to minor updates before commencement. Any changes will be communicated to enrolled students at least 72 hours in advance via Google Classroom.