AI Fundamentals – Course 1

Master Generative AI to Revolutionize Your Productivity by 2025

Category 1: AI Fundamentals — Unlocking AI's Potential: Core Concepts & Applications

This course strictly follows the official outline and learning goals. Tools used: ChatGPT, Claude, Gemini, Perplexity.

Course Overview

About This Course

This course empowers professionals and students to truly grasp artificial intelligence and harness its power to significantly boost productivity and creativity.

Learning Objectives

Understand the fundamental principles of modern AI.
Utilize AI tools for research, writing, and management.
Identify high-impact personal and professional applications.
Develop a critical perspective on automation.

Topics Covered

AI Fundamentals and Generative Models.
ChatGPT, Claude, Gemini, and Other Essential Tools.
Effective Prompt Engineering and Digital Ethics.

Audience & Prerequisites

Level: Beginner
Language: English
Prerequisites: None

Tools & Frameworks

ChatGPT, Claude, Gemini, Perplexity

Module 1: Introduction (30 min) — Discover AI Fundamentals and Practical Use Cases

Learning Outcomes

Define Artificial Intelligence (AI) and Generative AI (GenAI).
Differentiate traditional predictive ML from generative models.
Map AI applications to value: time saved, quality improved, cost reduced.

1. **Core Concepts**
   Definitions:

- AI vs. ML vs. DL: overview and relationships.
  Artificial Intelligence (AI) is the broad science of creating machines that can perform tasks requiring human-like intelligence, such as reasoning, learning, and problem-solving.
  Machine Learning (ML) is a subset of AI that focuses on teaching systems to learn patterns automatically from data instead of following explicit rules.
  Deep Learning (DL) is a specialized branch of ML that uses layered neural networks to process large amounts of unstructured data—such as text, images, or audio—enabling high-level abstraction and complex decision-making.
  In essence: AI is the overall goal → ML is one method to achieve it → DL is an advanced technique within ML.

- Transformers and self-attention (intuitive explanation).
  A **transformer** is a type of neural network architecture designed to understand relationships between elements in a sequence—such as words in a sentence—without processing them strictly in order.
  Its key mechanism, **self-attention**, allows the model to look at every part of the input simultaneously and decide which words (or tokens) are most relevant to each other. For example, when interpreting the phrase *"The cat sat on the mat because it was tired,"* self-attention helps the model link *"it"* correctly to *"cat."*
  This ability to focus on context gives transformers exceptional power in language understanding, translation, and content generation, forming the foundation of large language models like ChatGPT, Claude, and Gemini.

Generative tasks: text, code, images, audio; strengths and limits.
Generative AI systems can create new content in various formats:

- Text: drafting reports, summarizing documents, or writing creative pieces.
- Code: generating, explaining, or debugging programming scripts.
- Images: producing illustrations or design concepts from descriptions.
- Audio: synthesizing voices, music, or sound effects.

Strengths: speed, scalability, and creativity—AI can produce high-quality drafts or ideas in seconds, serving as a powerful assistant in communication, analysis, and design.

Limits: outputs may contain factual errors, bias, or stylistic inconsistency; models lack genuine understanding and rely on patterns from training data.
Effective human oversight is essential—AI provides inspiration and efficiency, but humans ensure accuracy, ethics, and context.

2. Comparative Landscape of Tools

ChatGPT (conversation, drafting, coding).
Claude (reasoning, summarization, safety-first).
Gemini (multimodal inputs/outputs).
Perplexity (live retrieval with citations).

3. Worked Example: From Data to Decision in Moroccan Tourism

Scenario: You're part of a team at the Moroccan National Tourism Office analyzing visitor feedback from Marrakech hotels. Goal: summarize insights and prepare a short policy brief.

- ChatGPT prompt: "Summarize these customer reviews into 5 key satisfaction themes and 3 improvement areas. Write in formal English for a government report."
- Claude: "Cross-check tone and identify culturally sensitive points or negative sentiment patterns."
- Perplexity: "Find current (last 12 months) tourism satisfaction statistics for Marrakech and compare them to national averages."
- Gemini: "Generate a 3-slide visual summary for presentation to the Ministry of Tourism."

Sample Visitor Feedback — Marrakech Hotels

1. "The riad was beautiful and clean, but the check-in took too long because staff seemed overwhelmed."
2. "Loved the traditional Moroccan breakfast — fresh msemen and mint tea every morning! The rooftop view of the medina was unforgettable."
3. "Wi-Fi connection was weak inside the room. I had to go to the courtyard to get signal."
4. "Excellent location near Jemaa el-Fna, but the noise at night made it hard to sleep."
5. "Staff were incredibly friendly and helped us book a desert tour to Merzouga — great hospitality!"
6. "Air conditioning worked well, but bathroom amenities were limited — no shampoo or tissues."
7. "The pool area is small but clean. Could use more shaded seating."
8. "Appreciated the authentic decor and cultural atmosphere; it felt like a true Moroccan experience."
9. "Would recommend clearer signs in English and French — hard to find our room the first night."
10. "Overall great value for money. Will definitely return and recommend to friends."
11.

4. Mini-Assessment (10 min)

Short-answer: Define Generative AI in one sentence.
Spot the difference: Predictive vs. generative outputs (two examples).
Reflect: Where could AI save you 2 hours/week immediately?

Instructor Notes

Emphasize limits: hallucinations, privacy, licensing of inputs/outputs.
Encourage tool triangulation (ask ≥2 models, compare).

Module 2: Hands-on AI Application (60 min) — Daily Manipulation of AI Tools for Enhanced Efficiency

Learning Outcomes

Apply prompt engineering patterns for reliable outputs.
Automate routine writing, planning, and research tasks.
Chain tools: generation → verification → formatting.

1. Prompt Engineering Essentials

1.1 The R-T-C-F Framework.

According to FunkPd, any effective prompt should be constructed using four key components: Role, Task, Constraints, Format (RTCF).

- **Role**: Specify who the AI should play ("Act as a senior research analyst," "You are a creative copy-writer," etc.).
- **Task**: Define what you want done ("Summarize these findings," "Generate three campaign ideas," etc.).
- **Constraints**: State boundaries or rules ("Use less than 150 words," "Do not reference confidential data," "Focus on the Moroccan market," etc.).
- **Format**: Specify how the output should appear ("Provide a table with columns A, B, C," "List bullet points," "Write in formal tone," etc.).

By following this structure you minimise ambiguity and maximise control over the model's output. FunkPd emphasise that treating a prompt like a question rather than an instruction tends to produce weaker results.

1.2 Few-Shot Prompting (Exemplars)

Few-shot prompting means you provide the model with one or more examples of input → output behaviour, thereby guiding it to imitate that style. For instance:

Example Template:

Role: "Act as a customer-feedback analyst."

Task: “Given the sample comments below, classify each comment as Positive/Neutral/Negative, and summarize key improvement points.”
Input-Example:

Comment: “Loved the rooftop terrace but the Wi-Fi was unreliable.” → Output-Example: “Neutral; improvement: Wi-Fi stability needed.”
Then: Your real input follows and the model replicates the pattern.

Few-shot prompts help by anchoring the model’s expectations of output format, style and level of detail.

1.3 Advanced Techniques: Delimiters, Uncertainty Estimates & Citations

- **Delimiters**: Use clear separators (e.g., “```”, “### Input”, “### Output”) so the model recognises structure.
- **Uncertainty Estimates**: Ask the model explicitly to provide a confidence score or uncertainty metric (e.g., “For each claim give a confidence percentage.”)
- **Citations / Sources**: Particularly when accuracy matters, require the model to list sources or flag uncertain claims. For example: “For each factual statement, provide a citation or indicate ‘no accessible source’.”

1.4 Sample Prompt Adapted to Moroccan Context

❖ R-T-C-F Framework

Role: You are a “Tourism Data Analyst for the Moroccan National Tourism Office.”
Task: “Analyse the following visitor feedback comments from Marrakech hotels. For each comment, classify the sentiment (Positive/Neutral/Negative), extract one key theme, and propose one actionable recommendation.”
Constraints: Use less than 100 words per comment; do not include confidential guest names; focus on Moroccan context and hospitality practices.
Format: Provide results in a table with columns: Comment | Sentiment | Theme | Recommendation.

❖ Few-shot Example (provided to the model):

“Loved the traditional breakfast and rooftop view, but check-in was slow.” → “Positive / Service flow / Streamline check-in via mobile app.”
Then: “Now analyse the following set of comments:” [insert new comments]
Additional Instruction: After the table, list any themes that occur in more than one comment and estimate your confidence in each recommendation (High / Medium / Low).

1.5 Instructor Notes

Emphasise to learners that crafting good prompts is engineering, not guesswork. The clearer the instructions, the better the output.
Encourage experimentation: ask students to alter one component (e.g., increase word-limit or change format) and compare results.

Highlight the importance of verification when relying on AI outputs — even a well-structured prompt can lead to errors or bias if unchecked.

2. Tool Walkthroughs

A) ChatGPT — Email and Report Boilerplates

1. Prompt: “You are a customer success lead. Draft a concise reply to the complaint below. Constraints: empathetic, 140–180 words, end with two actionable next steps. Output: plain text then bullet list of steps.”
2. Refine: “Shorten by 15% without losing meaning. Replace jargon with plain language. Keep tone confident and warm.”
3. Quality check: “List three weak points in your draft and improve them.”

B) Claude — Summarising and Reviewing Safely

1. Task: Combine notes from different local sources — for example, a ministry meeting summary and a tourism article about Marrakech or Agadir.
2. Prompt Example:
   “Create a short, neutral summary of these notes. Highlight any opinions or subjective statements, and add a line such as ‘Some information may require confirmation from official Moroccan sources’ wherever the data is uncertain.”
3. Follow-up Prompt:
   “List any viewpoints or ideas that seem missing — for example, perspectives from local businesses, visitors, or regional authorities.”

C) Gemini — Multimodal Planning

1. Upload an image of a whiteboard or a chart, ask: “Extract action items and due dates; propose a 2-week sprint plan (table).”
2. Ask for a visual outline (slide titles + bullet points).

PS: whiteboard image attached

D) Perplexity — Retrieval and Fact-Checking

1. Query: “What is the latest guidance on AI disclosure in marketing materials? Provide 3 reputable sources.”
2. Prompt: “Cross-verify each claim from this draft with citations; mark unverified items.”

3. Practice Set (30 min)

Task A: Draft → Refine → Verify: marketing email then citation check.
Task B: Meeting-to-plan: convert meeting transcript to sprint backlog (Gemini).
Task C: Risk register: ask Claude to extract risks from notes and rate likelihood/impact.

Rating scale (10 pts)

Clarity/Structure (3) | Accuracy/Verification (3) | Ethical/Privacy handling (2) | Format adherence (2)

Module 3: Professional Applications (45 min) — Implementing AI Across Various Professional Contexts

Learning Outcomes

Map AI use-cases across sectors (education, marketing, healthcare, finance, operations).
Design a lightweight AI adoption plan with guardrails.
Measure impact with simple KPIs.

1. Sector Playbooks (illustrative)

- *Education*

Goal: Use AI tools to enhance teaching quality, feedback, and accessibility across Moroccan schools and universities.

- Claude — Personalized Lesson Summaries & Socratic Q&A

Example use: A secondary-school teacher in Rabat uploads student essays about "The impact of water scarcity on Moroccan agriculture."
Prompt:
"Summarize each essay in 3 bullet points highlighting understanding of causes, effects, and proposed solutions.
Then generate 5 Socratic questions to stimulate deeper discussion in class."
Data Source: anonymized student submissions.
Outcome: Claude generates personalized feedback for each student, guiding them toward critical thinking and policy relevance.
PS: Use the attached essays file "Essays_Water_Scarcity_Morocco.docx"

- Gemini — Diagram Conversion and Quiz Generation

Example use: A physics teacher at Hassan II University wants to create practice materials.
Prompt:
"Here is a photo of a circuit diagram used in my high-school class.
Convert it into a clear text explanation, then generate 5 multiple-choice questions (Arabic + French) with correct answers marked."
Data Source: attached image file.
Outcome: Gemini provides bilingual, accessibility-ready quiz content for students with visual impairments or distance learners.

❖ *Marketing*

Goal**:** Demonstrate how AI can empower Moroccan marketing professionals, SMEs, and tourism agencies to create authentic, data-driven, and culturally resonant campaigns.

- ChatGPT — Campaign Briefs, A/B Variants, and Style Transfers

Use Case: A marketing consultant in Casablanca designs a social-media campaign for a local argan-oil cooperative targeting both domestic and international consumers.

Prompt Example:

"Act as a Moroccan digital marketing strategist. Create two short social-media ad versions (A/B test) promoting pure argan oil produced by women's cooperatives in Essaouira.

- Version A: Use a warm, emotional, cultural tone highlighting tradition and sustainability.
- Version B: Use an informative, modern tone focusing on product quality and export standards.

Each version should be around 80–100 words, include a call-to-action in French or Darija, and end with a tagline suitable for Instagram."

Expected Output:

- Version A: Evokes heritage and community empowerment.
- Version B: Emphasizes transparency and international certification.

Both provide ready-to-publish text that respects Moroccan identity while appealing to global audiences.

Style-Transfer Example:

"Rewrite this promotional text in three different tones: (1) traditional Moroccan storytelling, (2) luxury brand style, (3) youth-friendly Darija tone for TikTok."

Outcome: ChatGPT produces consistent multi-tone content, enabling marketing teams to test engagement across audience segments.

- Perplexity — Competitor Scan and Market Statistics Validation

Use Case: A digital-marketing agency in Marrakesh wants to verify current market data before launching a campaign for Moroccan organic cosmetics.

Prompt Example:

"Search for current (2024–2025) statistics on Morocco's organic-cosmetics exports and domestic market size. Provide a summary table with the following columns: Segment | Value in MAD | Growth % | Source (linked).

Focus on Moroccan government or trade agencies (HCP, ONSSA, Maroc Export AMDIE, ONMT).

End with a short paragraph identifying 2–3 key competitors and their differentiators."

Expected Output:

A verified table combining recent trade and tourism data (e.g., ONMT reports, WTO export figures), including citations and short analytical commentary.

Follow-Up Prompt:
“Based on these insights, generate three evidence-based marketing angles for Moroccan organic products targeting the European and Gulf markets.”
Outcome:

- Perplexity produces up-to-date references.
- Marketers can quickly transform verified insights into campaign briefs.
- The workflow models ethical, data-driven decision-making aligned with Moroccan export priorities.

❖ *Healthcare (Non-Clinical / Operational)*

Goal: Show how AI tools can support administrative, policy, and communication tasks in Morocco’s healthcare ecosystem — without offering clinical advice or replacing medical professionals.

- Gemini — Literature Structuring and Policy Digest

Use Case: A policy officer at the Ministry of Health and Social Protection is compiling a report on primary-care digitization initiatives in Moroccan rural areas.

Prompt Example:
“Summarize and structure the following excerpts from Ministry of Health reports and WHO studies on Morocco’s digital-health programs.
Organize the information under these sections: Objectives, Implementation, Achievements, Challenges, Recommendations. Write in formal French, 200 words per section. Add a 3-line executive summary in English.”

Data Source: official PDFs or public-policy documents (e.g attached documents can be used).

Expected Output:

- A clearly formatted policy digest, organized for presentation to a ministerial committee.
- Balanced synthesis that highlights national progress and areas needing improvement (e.g., infrastructure, training).
- An output example has been provided in the attachments

Follow-Up Prompt:
“Based on this summary, create a 5-slide outline for a policy briefing to regional health directors.”
Outcome: Gemini converts scattered notes into structured policy material, ready for internal communication or publication. (example slides have been provided in the attachments)

2. Governance and Ethics Checklist

PII handling: do not paste sensitive data into public tools.

Attribution: record sources; indicate AI assistance in outputs where needed.
Hallucination mitigation: verify with Perplexity; require confidence notes.
Model choice: match task to tool; avoid single-source dependency.

3. KPI Starter Set

Time saved per deliverable (minutes/hours).
Quality score (review rubric).
Error rate / rework count.
Adoption rate (weekly active use).

Worksheet

4. Pick a role-specific process (e.g., monthly report).
5. Decompose into steps; tag each step as Generate / Verify / Format.
6. Assign tool(s) and prompts; define KPI and baseline.

Module 4: Project (45 min) — Personalized Practical Application and Development

Goal

Design and demonstrate a personalized AI workflow that saves ≥90 minutes/week or improves quality measurably.

Deliverables

Process map (current vs. AI-augmented).
Prompt library (final prompts + 1–2 alternatives each).
Evidence pack: before/after samples, timing screenshots or logs.
Reflection: risks encountered, verification plan, next steps.

Suggested Project Tracks

Newsletter autopilot: Perplexity sourcing → ChatGPT drafting → Claude critique → Gemini slides.
Meeting intelligence: Gemini extract → Claude synthesize → ChatGPT action emails.
Research assistant: Perplexity corpus → Claude neutral brief → ChatGPT executive summary.

Assessment Rubric (20 pts)

Impact (6) | Rigor (verification & ethics) (6) | Craft (clarity, formatting) (4) | Reusability (4)

Appendix A — Prompt Templates

RTCF Master Prompt

Role: <your role>. Task: <goal>. Constraints: <tone, length, audience, policies>. Format: <bullets/table/JSON>.
Context: <paste notes>. Steps: 1) Draft 2) Critique 3) Refine. Add confidence and list assumptions.

Verification Prompt (Perplexity)

“Cross-verify the following claims with current sources; return a table with Claim | Evidence | Source | Confidence. Flag contradictions.”

Appendix B — Ethical Guardrails

Do not upload confidential data to public models; mask/redact inputs.
Record when and how AI contributed to the work product.
Prefer sources with transparent provenance; avoid overclaiming certainty.

Appendix C — Quick Reference (Tools)

ChatGPT: drafting, code and structure; excels at style control.
Claude: long-context critique and balanced summaries.
Gemini: multimodal extraction/structuring from images and text.
Perplexity: retrieval with citation-first answers for claims.