## **1. Project Objectives**

* Provide students with instant, accurate answers to common questions about courses, schedules, examinations, study materials, library resources, and faculty information.
* Showcase bilingual (English/Arabic) support while acknowledging that English answers may initially be of higher fidelity because the reference material is primarily in English.
* Validate the end‑to‑end technical workflow which includes data ingestion, vector indexing, tool/agent orchestration, and conversational UI.

## **2. Services To Be Provided**

**- Academic Assistance**

* **Course Information** – Details on courses, Majors, syllabus, and prerequisites.
  + Majors: you can find it in admission guide PDF
    - What majors does the university offer?
    - What are the available faculties university have?
    - What majors does the faculty of engineering have?
    - Can you list all the undergraduate majors available?
    - Can you tell me the required prerequisites for the Computer Science major?
    - Can you list all the undergraduate majors available?
    - How many credits does a computer science major have?
    - What is the prerequisite to take course csc 226?
* **Class Schedules** – Timetable updates and reminders.
  + Times: class timetable PDF
    - When does the fall semester start and end?
    - Can I see the class csc 226 schedule for the upcoming semester?
    - What are the lecture times for [Course Name]?
    - When does the fall semester final exams starts?
* **Exam Alerts & Deadlines** – Deadlines and schedules.
  + Exam Schedules: Exam Schedule PDF
    - When will the final exam schedule be released?
    - What time is my [Course Name] exam?
    - Are exams held online or on campus?
    - Where will my exam csc 226 be held?
  + We can have a PDF for deadline for registrations
* **Study Resources** – Links to notes, and past exams.
  + We can create small file service where it contain each course name and previous exams
    - Where can I find study materials for my courses?
    - Do you have previous exam papers I can practice with?
    - Is there a place to access course lecture slides or notes?
    - Can you suggest resources to help me study for [Course Name]?
    - Are there any recommended textbooks for my major?
  + Refer to the excel sheet: Course\_Study\_Materials
  + Students can ask the system questions related to their studies and they will get the reply with the reference from the books or valid resources.
* **Library** - Book availability and borrowing process.
  + Preferably to have a small DB for POC purposes to show the capability. Also when a student rents a book and DB will be updated.
    - How can I check if a book is available in the library?
    - What’s the process to borrow a book from the library?
    - What is the borrowing duration for students?
    - Is book 1948 available for renting?
    - What is the cost for renting book “1984”?
    - How much does the book “who moved my cheese” cost?
  + Refer to the excel sheet: books\_catalog
* **Professors details:** professor details, office hours, and teaching courses. Schedule meeting with the professor before going
  + Refer to the PDFs: Nazir Hawi, Hoda Maalof
    - Who is teaching [Course Name] this semester?
    - How can I find a professor’s “Hoda Maalouf” contact information?
    - What are Professor [Name]’s office hours?
    - Where is Professor [Name]’s office located?
    - Can I schedule a meeting with my professor?
    - What courses is Professor [Name] currently teaching?
  + We can add also under each instructor the courses he/she teaches and timings
* **Voice to text feature**: provide a mechanics to record instructor voice, take notes, and summarize important notes using AI

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## **3. Data Sources & Assumptions**

* **Dummy data** (PDFs, Excel files, and sample databases) are provided at the shared Google Drive link. These artefacts will form the knowledge base for the POC only.
* To control scope, documents with complex layouts (images, graphs, or tables) will be excluded at this stage.
* A lightweight relational schema will be created to simulate live services such as library inventory or class timetables.
* Drive Link: <https://drive.google.com/drive/folders/1K4TtQF_TaMbJ9wTHRejgaaHbtj68L0xB?usp=sharing>

## **4. Project Milestones**

| # | Milestone | Description | Target Output |
| --- | --- | --- | --- |
| 1 | **Agentic Workflow Setup** | Establish Streamlit skeleton; create dummy SQL/NoSQL stores to emulate institutional APIs. | Running a local prototype that returns hard‑coded responses. |
| 2 | **Data Preparation & Vectorisation** | Clean, chunk, and embed documents; ingest embeddings into Qdrant. | Populated vector index. |
| 3 | **Tooling & Agent Orchestration** | Build retrieval‑augmented generation (RAG) pipeline and implement tools required to answer example questions. | Chatbot answers reference queries correctly. |
| 4 | **Voice‑to‑Text Module** | Integrate speech capture, diarisation, and note‑summarisation workflow as a distinct component. | Demonstrable voice recording and summarisation feature. |

**5. API Keys Needed**

1. OpenAI API key
2. Openrouter API key
3. Qdrant API key
4. Qdrant Cluster URL

## **6. Out‑of‑Scope Items**

* Integration with live production databases or authentication systems.
* Support for documents containing complex visual layouts (until a later phase).
* Mobile application packaging.

## **7. Final Deliverables**

* Standalone chatbot deployed on streamlit
* Chatbot is able to answer questions defined in the scope above
* Scripts used for data ingestion and preprocessing
* Complete source code for the chatbot