



BIG RED RECOMMENDER

An AI-Driven Personalized Course Recommender

By Team 7:

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User Persona

- **Name:** Amy Chen
- **Education:** 1st-year Master's (Engineering Management)
- **Interests:** Product Management, Tech Innovation
- **Preference:** Graded, Graduate-level courses
- **Pain Point:** Too many vague course titles, wants clarity



Project Overview

The goal of this project is to build an **AI-powered course recommendation system** that helps students discover the most relevant Cornell courses based on their interests, academic level (graduate/undergraduate), and grading preferences.

The system uses **semantic understanding** rather than simple keyword matching, enabling it to recommend courses even if exact words don't match but the **meaning** is related.



Everything Data

Label: Clearly defined Courses

Data Sources

- **Data Source 1:** Cornell Roster
[Link:
<https://classes.cornell.edu/browse/roster/SP25/class/ARKEO/2661>]
- **Data Source 2:** Student-specific survey data

Data Preparation

- Dataset Merging
- Data Cleaning and Standardization
- Semantic Text Construction
- Caching and Optimization



Technology Overview

Components	Technology & Model
Semantic Embedding	all-MiniLM-L6-v2 from HuggingFace Transformers
Similarity Calculation	Cosine Similarity (Scikit-Learn)
UI Development	Gradio (Blocks + Markdown + HTML)
Data Handling	Pandas, NumPy
Data Storage	Local caching via Pickle and Numpy
Environment	Google Colab (Prototype Phase)



Demo Screenshot

Find Your Perfect Course at Cornell

Enter your interests below and we'll match you to the best available courses!

 Your Interest

Product management in technology



 Graduate (G) or Undergraduate (U)?

Optional



G



U

 Graded (G) or Non-Graded (N)?

Optional



G



N

 Find Courses

 Clear

▼ 1. 5920 - Product Management [ENMG]

Similarity Score: 0.7367

Description:

Product Management is one of the fastest growing careers in engineering and technology-based industries. In this course, you will learn the foundations of product management including (i) preparing for success as a product manager, (ii) identifying and targeting customer needs, (iii) prioritizing your project needs, and (iv) designing, developing, and deploying your product across the product life cycle. Using skills developed through course lectures and discussions, you will complete in a project where you will practice the sprint model utilized in most product teams. This course is for students interested in pursuing a career as a product manager in engineering or technology-based companies, learning about the product management competency, or working in a non-traditional tech setting to apply these skills on complex systems.

▶ 2. 5200 - Product Management [TECH]

▶ 3. 6045 - Innovation and New Product Management [NBA]

▶ 4. 5830 - Introduction to Technical Management [ECE]

▶ 5. 5630 - Advanced Product Design [MAE]



Challenges and Assumptions

Challenges

- **Fine-Grained Matching**
Highly specific student queries (e.g., "blockchain for finance") may not precisely align with broader course descriptions (e.g., "emerging technologies").
- **Cold Start — No Personalization Yet**
The system does not leverage student history or preferences; every recommendation is based purely on the new input query.
- **Ambiguity in User Queries**
General terms like "management" can refer to multiple disciplines, introducing uncertainty in course matching.

Assumptions

- **Users Input Serious Academic Interests**
We assume students enter thoughtful, course-relevant queries rather than random or off-topic inputs.
- **Students Prefer Curated Shortlists**
We assume students value a Top 5 recommendation list over browsing a full course catalog.
- **English as Primary Language**
We assume all course descriptions and user queries are provided in English, ensuring semantic consistency.



Expected Impact

- Personalized, efficient, and goal-driven course recommendations.
- Significant potential to scale across universities.
- Business value by reducing advising loads, enhancing student engagement, and improving curriculum navigation.
- Real potential to become an institutional EdTech product.



Next Steps

- Expand the semantic search model by incorporating keyphrase extraction, course-level tags, and additional metadata (such as course outcomes and keywords) to better align with highly specific student queries.
- Introduce student profile histories by gradually building a lightweight profile of each student's interests and past course selections to refine future recommendations.
- Add clarifying questions for broad queries and cluster semantically similar course categories to improve matching accuracy.
- Add course feedback as a new data source to continuously refine recommendations.



Thank You!

