**Weekly Timeline with Specific Deliverables for CulturalConnect Capstone Project**

This timeline provides a structured **week-by-week** breakdown, ensuring steady progress and clear deliverables.

**Week 4: System Architecture & Backend Setup**

**Goals:**

* Define the system architecture.
* Set up backend infrastructure and database.

**Deliverables:**  
✅ Create **system design documentation** (API routes, entity-relationship diagrams).  
✅ Define **MongoDB schema** for user profiles, hobbies, and food data.  
✅ Set up **Node.js + Express** server and connect it to MongoDB.  
✅ Implement basic **user authentication** (JWT-based signup/login).

**Week 5: Backend API Development**

**Goals:**

* Develop backend CRUD operations.
* Finalize API endpoints.

**Deliverables:**  
✅ Implement **CRUD operations** for user data, hobbies, and food spots.  
✅ Develop API for **saving and retrieving user preferences**.  
✅ Test API endpoints using **Postman**.  
✅ Set up **error handling & input validation** for APIs.

**Week 6: Frontend Development - UI Setup**

**Goals:**

* Build the core frontend layout.
* Implement user registration & login flow.

**Deliverables:**  
✅ Set up **React.js project** and install dependencies (Tailwind, Axios).  
✅ Implement **user authentication (signup/login)** UI.  
✅ Connect frontend **authentication flow** to backend.  
✅ Develop **basic UI components** (navbar, forms, dashboard layout).

**Week 7: Frontend - User Profile & Preferences Input**

**Goals:**

* Allow users to input preferences.
* Connect UI with backend APIs.

**Deliverables:**  
✅ Develop **profile settings page** where users can enter hobbies & food preferences.  
✅ Implement API calls for **saving user data** to MongoDB.  
✅ Improve UI with **responsive design** using Tailwind.  
✅ Ensure **state management** using React Context or Redux.

**Week 8: Implement Collaborative & Content-Based Filtering**

**Goals:**

* Develop the **AI recommendation system**.

**Deliverables:**  
✅ Implement **Collaborative Filtering** (user-item interactions).  
✅ Implement **Content-Based Filtering** (NLP-based preference matching).  
✅ Store **recommendation results** in MongoDB for quick access.  
✅ Create **backend API for retrieving recommendations**.

**Week 9: Integrate Recommendations with Frontend**

**Goals:**

* Display recommended hobbies & food spots on the UI.

**Deliverables:**  
✅ Fetch **recommendation data** from the backend API.  
✅ Display recommendations in **dashboard UI**.  
✅ Implement a **filtering system** (e.g., indoor/outdoor hobbies).  
✅ Allow users to **like/save recommendations** for future reference.

**Week 10: Integrate Generative AI (GPT-4) for Unique Suggestions**

**Goals:**

* Use **GPT-4 API** to generate creative hobby ideas.

**Deliverables:**  
✅ Implement OpenAI API to generate **customized hobby suggestions**.  
✅ Integrate **AI-generated recommendations** into the system.  
✅ Store **generated recommendations** in the database for reuse.  
✅ Allow users to **rate AI-generated suggestions** for improvement.

**Week 11: Testing & Optimization of AI Models**

**Goals:**

* Fine-tune recommendation accuracy.
* Conduct **performance testing** on AI models.

**Deliverables:**  
✅ Improve **recommendation relevance** by adjusting ML models.  
✅ Conduct **A/B testing** on different recommendation approaches.  
✅ Optimize **response time** for real-time recommendation generation.  
✅ Ensure AI models work efficiently **within cloud deployment**.

**Week 12: UI/UX Improvements & Feedback Integration**

**Goals:**

* Enhance the **user experience** based on feedback.

**Deliverables:**  
✅ Implement **loading indicators** for recommendations.  
✅ Improve **dashboard aesthetics & accessibility**.  
✅ Collect feedback from **test users** and refine UI.  
✅ Add **gamification features** (e.g., badges for trying new hobbies).

**Week 13: Final Testing & Cloud Deployment**

**Goals:**

* Deploy the app to **Google Cloud**.
* Ensure **backend, frontend, and AI models** function correctly.

**Deliverables:**  
✅ Deploy **backend & database** on Google Cloud.  
✅ Deploy **frontend** (Vercel or Netlify).  
✅ Conduct **final bug fixes** and security enhancements.  
✅ Perform **load testing** to ensure the app handles multiple users.

**Week 14: Final Debugging & Demo Preparation**

**Goals:**

* Ensure a **smooth project presentation**.

**Deliverables:**  
✅ Final debugging & **cross-browser testing**.  
✅ Prepare **video demo** showcasing key features.  
✅ Final **security review** before submission.  
✅ Review all **documentation & code comments**.

**Week 15: Final Presentation & Submission**

**Goals:**

* Deliver a professional **capstone presentation**.

**Deliverables:**  
✅ Complete **technical documentation** (API guide, architecture).  
✅ Finalize **presentation slides** with visuals.  
✅ Conduct a **mock presentation** for practice.  
✅ Submit the final project report & code repository.

**Final Notes**

* **Daily Check-ins:** Stay accountable with short team updates.
* **Weekly Progress Reviews:** Evaluate completed tasks and adjust plans as needed.
* **Continuous Testing:** Detect issues early to avoid last-minute rush.

This weekly roadmap ensures steady progress, with **clear goals and actionable deliverables**. Let me know if you need refinements! 🚀