COLORADO SCHOOL OF MINES | Labriola Innovation Hub

CSCI 370 Field Session Project Proposal, Fall 2026

Project Background and Description

Client Information:

The Labriola Innovation Complex is a dynamic, 40,000 sq-ft space designed to foster innovation and creativity among thousands of potential users. It includes the Labriola Innovation Hub and the Aramco xWorks project bays. The InnoHub launched in February of 2024 and since that time 3,000+ students have been trained in the wood, metal, electronics, composites shops and the makerspace. The InnoHub provides dedicated project support and mentoring, has now launched a Prototyping Fund Program, and hosts workshops on design and technical content. CSCI 370 students would work with Director Victoria Bill, Operations Manager Julia Roos, and Shop Managers Anna Lugthart and Arianna Morales on this project.

Project Description:

To efficiently manage access to training, equipment, and resources, we require a well-structured system that integrates various components to streamline user interaction and manage user training data. This digital system will need to accept and store various data in coordination with physical tap in and check out devices. The list below outlines a list of subsystems needed to make the InnoHub more accessible, user-friendly, and efficient by addressing the key components of user access and equipment management.

Images of the current alpha version developed by CS Field Session students over summer 2025 are shown in Appendix A. The Fall 2025 CS field session team implemented training data updates, a tap-in that interfaces with the current Oreconnect system, and implementation in each of the Labriola InnoHub shops and makerspace. The Fall 2026 team should plan to work from this version.

Design work will include supporting future design options described below in coordination with the Innovation Hub team, focusing on new data tracking methods to see when a user has last checked in to a space, potentially tracking 3D printer status and providing an online portal where that could be viewed, providing a visual representation of all users in the space, new features to interface with Canvas for data editing, and additional options for highlighting data to TAs and users when checking in.

This system will need to:

- Pull all training information from Canvas

- Checking into an InnoHub workspace using a blaster card tap scanner that will pull up data about which training that user has completed in that workshop (interface with pre-built or redesigned database) and display that information in an accessible format
- Tap in to check out tools from the tool crib (Lib Cal integration with user database)
- Training expiration notification and instructions for re-upping on trainings
- Remove graduated users from Canvas (Canvas integration)
- Maintain a history of shop check-ins in case issues arise
- Provide a visual representation of all users currently checked into a specific workspace and their training status
- Support future expansions that may include additional external/user-facing uses and potential internal interface (modular and scalable architecture; cloud-based deployment; user app; name tag printing, etc)

Note: example frontend and tap in systems from other university makerspaces are provided below in the appendices B & C as motivation. The system created for this project should be unique to the Colorado School of Mines.

Desired Skill Set:

- Database Management
- API Integration
- RFID/NFC Programming
- Hardware Integration
- Python/JavaScript/C++/Node.js
- GUI Development (frontend and backend)
- Data Security and Access Control
- Cloud Development
- Automation and Notifications

Team Size: 3-4 students

Work Location: Students will work closely with InnoHub Management; work will take place at the Labriola Innovation Hub or remotely.

NDA: Not applicable, no NDA required.

Intellectual Property: Colorado School of Mines and the Labriola Innovation Hub will retain ownership of all code developed.

Appendix A: Summer 2025 Field Session Training Tracker Portal

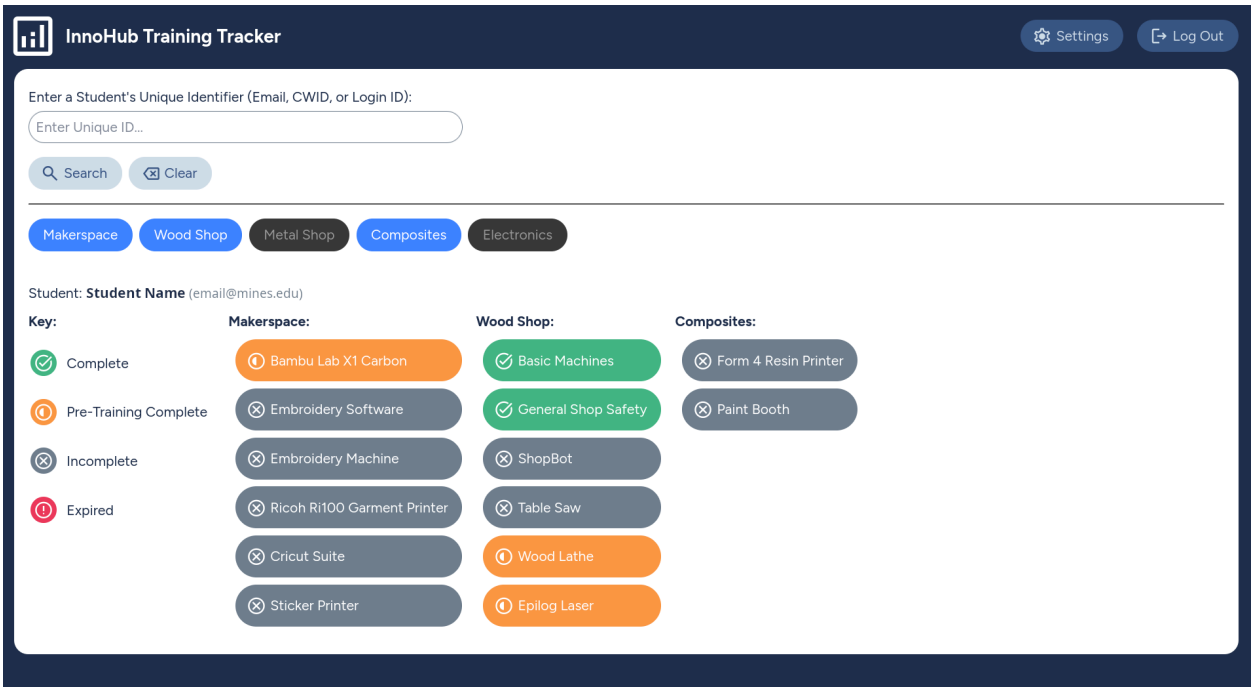

Figure A1: Search Page for InnoHub Training Tracker

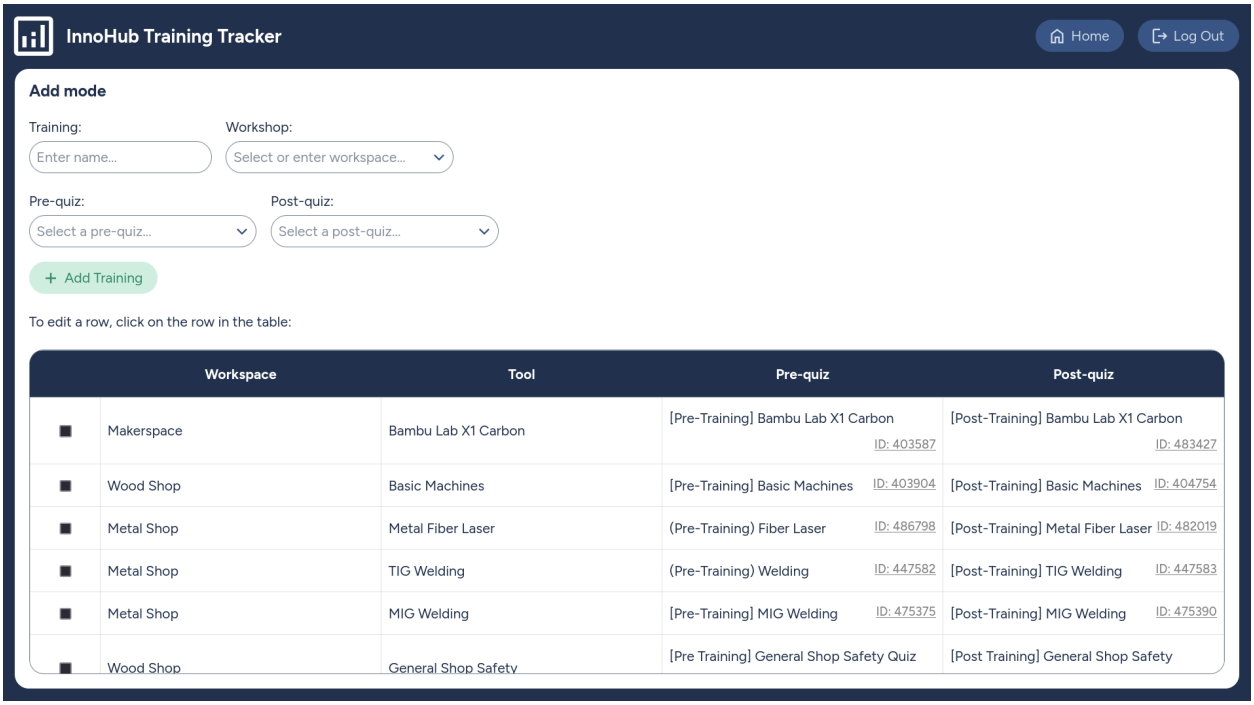

Figure A2: Configuration Page for InnoHub Training Tracker

Appendix B: Example Front End Webapp from NYU Makerspace

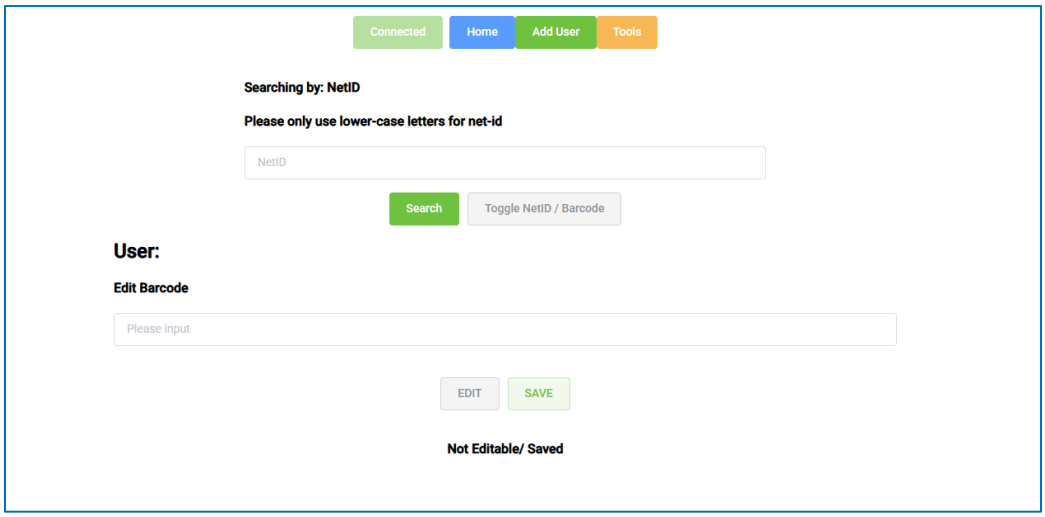

Figure B1: Simple Web-Based Interface Allows for Search by ID Number or ID Card Barcode

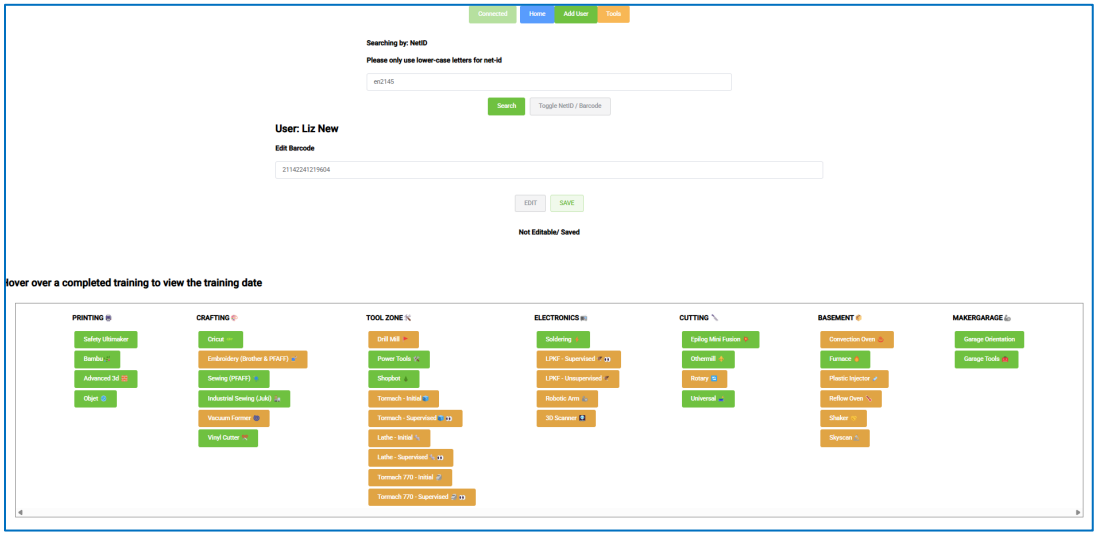

Figure B2: Quick Search Showing Completed Trainings and Machines

Appendix C: Example Physical Check-In Stations from CU Boulder

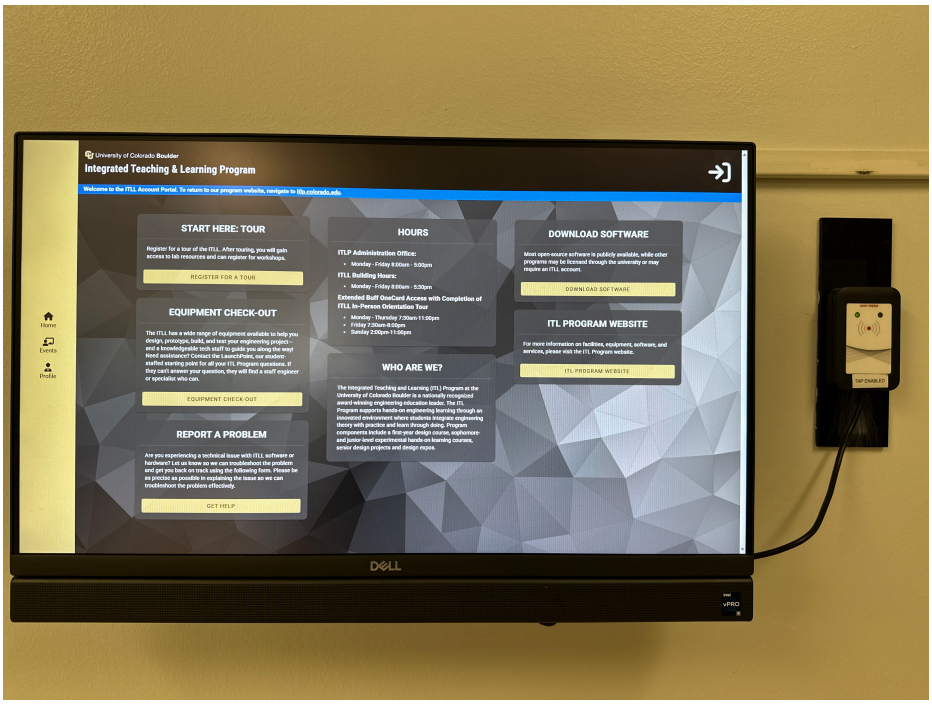

Figure C1: Integrated Card Reader with Informational Display

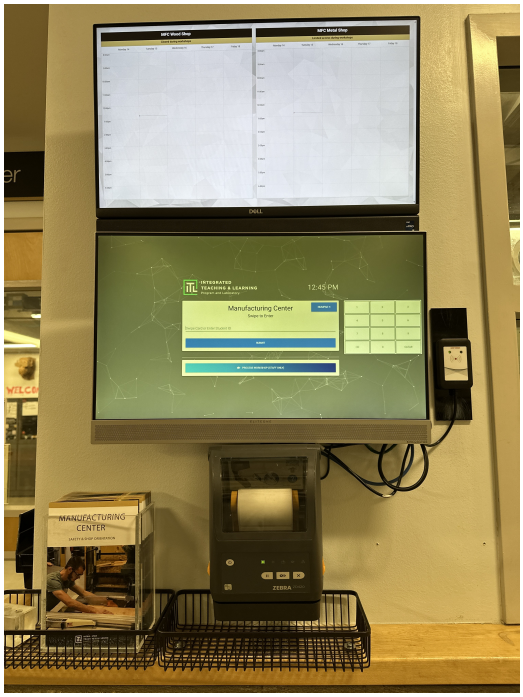

Figure C2: Integrated Card Reader with Display Showing Training Record, Name Tag Printout