AMMAN ARAB UNIVERSITY

Faculty of Information Technology

TRACE

PROJECT SCOPE STATEMENT

DATE: DECEMBER 12, 2025

Project Title: TRACE - Transfer Recognition and Automated Course Engine

Project Start Date:	**Projected Finish Date:**
November 1, 2025	June 15, 2026

Students

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Amman - Jordan
2025/2026

Project Justification

The current manual process for evaluating course equivalency and credit transfer at the Faculty of Information Technology, Amman Arab University, is time-consuming, inconsistent, and prone to human error. Faculty members must manually review course descriptions, compare learning outcomes, and determine equivalencies for each transfer request, which often leads to:

- **Processing delays:** Transfer evaluations can take several weeks, delaying student enrollment and academic progression
- **Inconsistent decisions:** Different professors may reach different conclusions for similar courses, leading to fairness concerns
- **High faculty workload:** Significant time spent on repetitive comparison tasks that could be automated
- **Limited capacity:** The manual process cannot scale to handle increasing numbers of transfer applications
- **Documentation gaps:** Lack of centralized repository for past decisions and institutional knowledge

The TRACE system addresses these challenges by automating course comparison, standardizing evaluation criteria, and streamlining the approval workflow. This project is justified by the significant time savings for faculty (estimated 70% reduction in evaluation time), improved consistency and fairness in decisions, enhanced student satisfaction through faster processing, and creation of a valuable knowledge base for future transfers. The minimal financial investment ($950-$1,100) combined with substantial operational benefits makes this project highly cost-effective for the Faculty of IT.

Product Characteristics and Requirements

The TRACE system is a web-based application designed to automate and streamline the course equivalency evaluation process for the Faculty of Information Technology. The system provides the following key characteristics and capabilities:

1. Role-Based Access Control and User Management

The system implements secure authentication and authorization with three distinct user roles, each with specific permissions and capabilities:

- **Admin:** Full system access including user management, course catalog management, system configuration, bulk data import/export, and access to all transfer requests and reports
- **Professor:** Evaluate transfer requests, view system-suggested course matches, add comments and justifications, recommend equivalencies, and access courses and requests within their department
- **Head of Department (HOD):** Review professor evaluations, provide final approval or rejection, access analytics dashboard, generate official reports, and oversee all transfer activities within the department

User authentication is secured with encrypted passwords, session management, and activity logging for audit purposes.

2. Intelligent Course Matching Algorithm

The core functionality of TRACE is its ability to automatically analyze and compare courses to identify potential equivalencies:

- **Text-Based Similarity Analysis:** The system uses intelligent text-matching algorithms (TF-IDF, cosine similarity) to compare course names, descriptions, learning outcomes, and topic keywords between the student's completed courses and the target curriculum
- **Similarity Scoring:** Each potential match is assigned a similarity score (0-100%) and confidence rating (High, Medium, Low) to help evaluators prioritize their review
- **Multiple Comparison Factors:** The algorithm considers course name similarity, description overlap, credit hour equivalence, course level matching, and prerequisite alignment
- **Accuracy Target:** The matching algorithm is designed and validated to achieve at least 85% accuracy compared to expert faculty evaluations

While the system provides intelligent suggestions, final decisions remain with qualified faculty members who can override or adjust recommendations based on their expertise.

3. Comprehensive Transfer Request Management

The system manages the complete lifecycle of transfer requests with robust tracking and workflow capabilities:

- **Request Creation:** Admins can create new transfer requests by entering student information, source university details, and uploading academic transcripts and course documents
- **Status Tracking:** Each request progresses through defined stages: Pending (awaiting evaluation), Evaluated (professor review complete), Approved (HOD approval granted), and Finalized (official report generated)
- **Document Management:** The system stores all supporting documents including transcripts, course syllabi, and previous equivalency decisions for easy reference
- **Search and Filtering:** Users can quickly find requests using filters for student name, source university, transfer type, date range, status, and assigned evaluator
- **Three Transfer Scenarios:** The system supports inter-university transfers (from other universities to AAU), intra-university transfers (between majors within AAU), and bridging programs (diploma to bachelor degree), each with scenario-specific rules and credit limits

4. Automated Official Report Generation

The system automatically generates professional, policy-compliant equivalency reports:

- **Report Templates:** Multiple report templates are available for different transfer scenarios, each compliant with university and Ministry of Higher Education formatting requirements
- **Comprehensive Information:** Reports include student details, source institution information, detailed course mapping (source course to target course), credit hours transferred, grades, justifications for acceptance or rejection, total credits transferred, and approval signatures
- **PDF Export:** Reports are generated in professional PDF format suitable for printing and official documentation
- **Automatic Calculations:** The system automatically calculates total transferred credits, remaining credits needed, and ensures compliance with maximum transfer limits per scenario

5. Course Catalog and Data Management

Robust tools for managing the course database that powers the equivalency matching:

- **CRUD Operations:** Create, Read, Update, and Delete course records including course codes, names, descriptions, credit hours, course levels, prerequisites, and learning outcomes
- **Bulk Import/Export:** CSV import functionality for efficiently adding multiple courses from the Faculty of IT catalog or external university catalogs
- **University Management:** Maintain a database of source universities and their programs to facilitate transfer request processing
- **Version Control:** Track changes to course information over time to support re-evaluation when curricula are updated
- **Data Validation:** Built-in validation rules ensure data quality and consistency (e.g., credit hours must be 1-4, course codes follow standard format)

6. Collaboration and Communication Features

Tools to facilitate communication and documentation throughout the evaluation process:

- **Comment System:** Professors and HOD can add timestamped comments and notes to transfer requests explaining their reasoning and decisions
- **Evaluation Justifications:** Structured fields for documenting why courses were accepted or rejected to maintain institutional knowledge
- **Activity Log:** Complete audit trail showing who made what changes and when, ensuring accountability and transparency
- **Notification System:** Email notifications (future enhancement) to inform users when requests are assigned, evaluated, or approved

7. Analytics and Reporting Dashboard (Optional)

Performance monitoring and decision-support tools for administrators and HOD:

- **Key Metrics:** Number of transfer requests per semester, average processing time from submission to finalization, acceptance/rejection rates, and most common source universities
- **Visual Analytics:** Charts and graphs displaying trends over time, workload distribution among faculty, and transfer scenario breakdown
- **Export Capabilities:** Generate summary reports for administrative review and strategic planning

Note: This feature is categorized as optional and may be implemented in a future version depending on project timeline and resources.

Product User Acceptance Criteria

The TRACE system will be considered successfully delivered and acceptable for deployment when it meets the following measurable criteria:

1. **Matching Accuracy:** The course matching algorithm achieves at least 85% agreement with expert faculty evaluations when tested on a sample of 50 historical transfer cases representing different transfer scenarios.
2. **Processing Time Improvement:** The system reduces average evaluation time from the current baseline (estimated 6-8 hours per complex case) to under 60 minutes per case, representing at least a 70% time savings.
3. **User Acceptance:** At least 75% of faculty evaluators (professors and HOD) who participate in user acceptance testing rate the system as "Useful" or "Very Useful" on standardized usability surveys, with an average satisfaction score of 4.0 or higher on a 5.0 scale.
4. **Report Quality:** All generated equivalency reports are verified to comply with university formatting standards and Ministry of Higher Education requirements, with zero critical formatting or content errors in a sample of 20 reports.
5. **Functional Completeness:** All mandatory (Must Have) requirements documented in the Requirements Traceability Matrix are successfully implemented and pass their acceptance tests with zero critical defects remaining.
6. **Documentation Quality:** Complete user manuals, technical documentation, and training materials are delivered and rated as "Clear" or "Very Clear" by at least 80% of test users.
7. **Security Compliance:** The system passes security testing with no high or critical vulnerabilities identified, and implements required authentication and authorization controls successfully.
8. **Project Delivery:** The system is completed and ready for deployment by June 15, 2026, within the allocated budget of $950-$1,100.

Project Exclusions

The following items are explicitly **OUT OF SCOPE** for this project and will not be included in the initial release:

- **Student Direct Access:** Students will NOT have the ability to directly access the system, submit transfer requests, or view evaluation status. All interactions remain faculty-only in Version 1.0. A future student portal may be considered in subsequent phases.
- **Other Faculties:** The system is designed and implemented exclusively for the Faculty of Information Technology. Expansion to other faculties (Engineering, Business, Arts, etc.) is not included in this project scope, though the architecture is designed to be extensible.
- **Automatic Curriculum Updates:** The system does not automatically update course catalogs or detect curriculum changes. All course information updates must be performed manually by authorized administrators.
- **Mobile Application:** Development of dedicated iOS or Android mobile applications is not included. The web-based interface is designed to be responsive for mobile browsers, but native apps are out of scope.
- **Advanced AI/Machine Learning:** While the system uses text-matching algorithms, implementation of advanced AI technologies such as deep learning, neural networks, or NLP transformers is excluded. The matching approach uses established techniques suitable for a student project timeframe.
- **Financial Transactions:** The system does not handle any financial processes such as tuition calculations, payment processing, or financial aid adjustments related to credit transfers.
- **Course Registration Integration:** The system does not interface with or modify student registration systems. It serves solely for equivalency evaluation and reporting.

Summary of Project Deliverables

Project Management-Related Deliverables:

- Business Case document
- Project Charter with stakeholder sign-offs
- Kick-off Meeting Agenda and minutes
- Requirements Collection Approach document
- Requirements Traceability Matrix (RTM)
- Project Scope Statement (this document)
- Work Breakdown Structure (WBS) and WBS Dictionary
- Project Schedule (Gantt Chart)
- Scope Validation and Change Control Strategy
- Risk Management Plan and risk register
- Test Plan and test case documentation
- Final Project Presentation (end of Graduation Project II)
- Final Project Report documenting complete system development
- Lessons Learned Report

Product-Related Deliverables:

1. System Analysis and Design Documents
1.1. System Requirements Specification (SRS) documenting all functional and non-functional requirements
1.2. System Architecture Design describing multi-tier architecture, technology stack, and component interactions
1.3. Database Design including Entity-Relationship Diagram (ERD) and database schema
1.4. User Interface (UI) Design mockups and wireframes for all user roles
1.5. Data Flow Diagrams (DFD) showing information flow through the system
1.6. Use Case Diagrams and specifications for key system features

2. TRACE Web Application (Fully Functional System)
2.1. Authentication and Authorization Module with role-based access control
2.2. User Management Interface for Admin role
2.3. Course Management Module with CRUD operations and CSV import capability
2.4. Transfer Request Management Module with complete lifecycle tracking
2.5. Intelligent Course Matching Engine with similarity scoring algorithm
2.6. Evaluation Interface for Professors with match suggestions and justification fields
2.7. Approval Interface for Head of Department with final decision authority
2.8. Official Report Generation Module with PDF export in multiple templates
2.9. Comment and Collaboration System with activity logging
2.10. Dashboard with system overview and key metrics (if time permits)

3. Database and Data Assets
3.1. MySQL database with complete schema implementation
3.2. Sample course catalog data for Faculty of IT
3.3. Test data including sample transfer cases and historical equivalency decisions
3.4. Database backup and restore procedures

4. Testing Deliverables

4.1.　Test Plan document describing testing strategy and approach

4.2.　Unit Test Cases and results for individual components

4.3.　Integration Test Cases and results for module interactions

4.4.　System Test Cases and results for end-to-end scenarios

4.5.　User Acceptance Test (UAT) Cases and results from faculty testing

4.6.　Defect Log and resolution tracking

5. Documentation and Training Materials

5.1.　System User Manual for all three user roles (Admin, Professor, HOD)

5.2.　Technical Documentation for system maintenance and future enhancements

5.3.　Installation and Deployment Guide

5.4.　Database Administration Guide

5.5.　Training Presentation slides for faculty onboarding

5.6.　Quick Reference Guides and FAQ document

6. Source Code and Development Assets

6.1.　Complete source code with inline documentation and comments

6.2.　Version control repository (Git) with commit history

6.3.　Configuration files and environment setup instructions

6.4.　Third-party libraries and dependencies documentation

Scope Statement Approval:

Dr. Mejhem Altarawneh - Project Sponsor　　　　　　　　Date:
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Dr. Marwan Alseid - Project Supervisor　　　　　　　　Date:
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Dr. Alaa Abuthawabeh - Project Co-Supervisor　　　　　　Date:
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Rasha Khalid Alsaleh - Co-Project Manager　　　　　　　Date:
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Sdra Osama Awameh - Co-Project Manager　　　　　　　Date:
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