AMMAN ARAB UNIVERSITY

Faculty of Information Technology

TRACE

BUSINESS CASE

DATE: NOVEMBER 26, 2025

Project Title: TRACE - Transfer Recognition and Automated Course Engine

Project Start Date:
November 1, 2025

Projected Finish Date:
June 15, 2026

Students

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Amman - Jordan
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1.0 Background:

Course equivalency and credit transfer are critical processes in higher education that allow students to continue their academic progression when transferring between universities, changing majors, or advancing from diploma to bachelor programs. Traditionally, these evaluations are performed manually by faculty members, who must review course descriptions, learning outcomes, and credit hours to determine equivalency. This manual process is often time-consuming, inconsistent, and prone to human error, especially when dealing with a large number of courses or complex curricula.

With the increasing digitalization of academic systems, universities are exploring automated solutions to improve efficiency, accuracy, and transparency in course evaluation. Modern technologies, including web-based platforms, structured databases, and intelligent text-matching algorithms, provide opportunities to standardize the evaluation process, reduce manual workload, and support fair decision-making.

The Faculty of Information Technology at Amman Arab University faces these challenges directly, as its current manual process can cause delays and inconsistencies in transfer decisions. Developing an Automated Course Equivalency System will address these issues by providing a reliable, data-driven solution that supports faculty in evaluating courses efficiently while complying with university and national regulations.

2.0 Business Objectives:

The business objective of the Automated Course Equivalency System is to improve efficiency, accuracy, and transparency in the credit transfer process at the Faculty of Information Technology, Amman Arab University.
Key goals include:

- **Reduce manual workload:** Automate course comparison and evaluation.
- **Ensure consistency and fairness:** Standardize decisions across evaluators.
- **Enhance accuracy:** Minimize human errors using intelligent matching algorithms.
- **Support transparency:** Generate clear, policy-compliant official reports.
- **Facilitate student progression:** Provide timely and reliable transfer decisions.

The system will initially serve the Faculty of Information Technology, with potential expansion to other faculties based on proven success and ROI demonstration.

3.0 Solution

To address the limitations of the current manual course equivalency process, the proposed solution is the development of a web based Automated Course Equivalency System for the Faculty of Information Technology at Amman Arab University. The system leverages structured course data, intelligent text matching algorithms, and automated reporting tools to streamline the evaluation workflow and improve decision making accuracy.

4.0 Current Situation and Problem/Opportunity Statement

Current Situation:

The Faculty of IT currently processes transfer cases across three categories: inter-university transfers, intra-university transfers between majors, and diploma-to-bachelor bridging programs. The existing manual process involves:

1. Student submits paper documents including transcripts and course syllabi.
2. Department secretary manually enters data into tracking spreadsheet.
3. Professor reviews documents, searches for similar courses in catalog, and manually compares course content.
4. Head of Department reviews professor's recommendations and provides final approval.
5. Administrative staff manually prepares equivalency letters using Word templates.

Problems Identified:

- **Time inefficiency**: Faculty members spend significant time per complex transfer case.
- **Inconsistent standards**: Different professors may reach different conclusions for similar courses.
- **Limited scalability**: Current manual capacity cannot accommodate growth in transfer applications.
- **Data fragmentation**: No centralized repository of past decisions for reference.
- **Error-prone processes**: Manual data entry and calculation can lead to occasional mistakes.

Opportunity:

Implementing TRACE presents an opportunity to transform this process through automation, standardization, and intelligent decision support. The system will significantly reduce faculty workload, enable processing of more cases annually, and create a valuable knowledge base of equivalency decisions that improves over time.

5.0 Critical Assumptions and Constraints

Critical Assumptions:

- **Accurate and complete course data:** It is assumed that all course descriptions, learning outcomes, credit hours, and related documents provided by students and universities are accurate and complete
- **Faculty participation:** Authorized faculty members, department heads, and administrators will actively use and validate the system recommendations
- **Algorithm effectiveness:** The intelligent text matching algorithm is assumed to achieve at least 85% accuracy in identifying course equivalencies
- **Compliance with regulations:** The system will operate within the guidelines and policies of the university and the Ministry of Higher Education

Constraints:

- **Budget constraint:** Project must be completed with minimal external costs, utilizing student development labor and free/low-cost hosting solutions
- **Scope constraint:** Initial release limited to Faculty of IT only; expansion to other faculties dependent on Phase 1 success
- **Limited access:** The current system version will only be used by faculty and administrators; students will not interact directly with the system
- **No external integration:** The system will not be connected to other universities databases or Ministry of Higher Education platforms
- **Manual curriculum updates:** Course catalog updates and curriculum changes will remain the responsibility of university staff and are not automated by the system

6.0 Analysis of Options and Recommendation

Option 1: Maintain Current Manual Process

- **Description:** Faculty members manually review course descriptions, learning outcomes, and credit hours to determine equivalency
- **Pros:** No development cost, familiar to current users
- **Cons:** Time-consuming, prone to human error, inconsistent evaluations, delayed student decisions, and poor documentation

Option 2: Purchase Commercial Transfer Credit Management Software

- **Description:** License existing commercial solution (e.g., MyTransfer, transferology)
- **Pros:** Proven solution, immediate availability, vendor support
- **Cons:** High licensing fees, may not align with Jordanian education system requirements, customization limitations

Option 3: Fully Automated Web-Based System In-House (Recommended)

- **Description:** Implement a web-based system using structured databases and intelligent text-matching algorithms to suggest course equivalencies and generate official reports.
- **Pros:**
  - Specifically designed for AAU Faculty of IT workflow and Jordanian context
  - High efficiency: Significantly reduces evaluation time
  - Full customization capability to match Ministry regulations
  - Accuracy: Minimizes human errors
  - Transparency**:** Automatically generates structured, policy-compliant reports
  - Scalability: Can be expanded to other faculties incrementally
- **Cons:** Requires initial development cost and faculty training
  - Requires 7 months development time
  - Dependent on student developer availability

Recommendation

Option 3, the **Fully Automated Web-Based System**, based on cost-effectiveness, alignment with institutional needs, and long-term sustainability. The low financial investment combined with high potential value makes this the optimal choice for AAU

7.0 Requirements

7.0.1 Functional Requirements

FR1: Internal Transfer - Same University, Different Major

- Compare courses across majors within the same university.
- Apply internal policies (e.g., maximum transferable credits).

FR2: External Transfer - Between Universities

- Support student transfers from other universities, Users can select or enter the previous university.
- Compare course names, descriptions, and topics against the target curriculum.

FR3: Bridging - Diploma to Bachelor

- Apply bridging rules such as GPA thresholds.
- Limit the number of transferable credits according to university regulations.

FR4: Same Major Transfer - From Another University

- Allow higher acceptance rates when curricula are highly similar (above a defined similarity threshold).
- GPA may affect the total accepted credits.

FR5: Cross-Discipline Transfer (e.g., Business → Software Engineering)

- Limit transferable credits (e.g., up to 30%).
- Provide warnings when few courses meet similarity requirements.

FR6: Re-evaluation

- Allow admins to re-run the equivalency engine when course data or equivalency rules change to regenerate updated equivalency reports.

7.0.2 Non-Functional Requirements

NFR1: Performance

- The system should provide equivalency suggestions quickly for both small and large numbers of courses.

NFR2: Reliability

- Ensure stable operation with minimal downtime and accurate processing of data.

NFR3: Security

- Protect student and academic data using authentication, authorization, and secure storage.

NFR4: Usability

- Provide a user-friendly interface for faculty and administrators to review recommendations and generate reports easily.

NFR5: Scalability

- Handle increasing numbers of courses, students, and transfer requests in the future.

NFR6: Compliance

- Ensure generated reports adhere to university and Ministry of Higher Education policies.

8.0 Budget Estimate and Financial Analysis

8.0.1 Budget Estimate

The estimated cost of developing the Automated Course Equivalency System is based on typical university level software project requirements. The budget includes development tools, hosting, and human resources. The estimated costs are as follows:

1. **Development Costs:**
   - Development tools, libraries, and APIs: **$200**
2. **Hosting & Infrastructure Costs:**
   - Hostinger Shared Hosting (1 year): **$3/month × 12 months = $36/year**
   - Domain name: **$15/year**
   - **Total Infrastructure Year 1: $51**
3. **Training & Documentation:**
   - User manual and admin training materials: **3 sessions × 2 hours × $40/hour = $240**

Total Estimated Cost: $400 – $550

Ongoing Annual Costs (Years 2-3):

- Hosting and Domain Renewal: $51/year
- System Maintenance: 5 hours/month × $10/hour × 12 months = $1,200/year
- Feature Updates and Enhancements: $100/year
- **Total Annual Operating Cost: $1,351/year**

8.0.2 Financial Analysis

The project requires minimal financial investment ($400 Year 1, $1,351 annually thereafter) while delivering substantial operational benefits through time savings, increased capacity, error reduction, and improved student satisfaction.

Key Financial Metrics:

- **Initial Investment:** $400 - $550
- **Annual Operating Cost:** $1,351 (hosting, maintenance, updates)
- **Expected Benefits:** Significant time savings and capacity improvements
- **Payback Period:** Expected to deliver value immediately upon deployment
- **Risk:** Very low financial risk given minimal investment

9.0 Schedule Estimate

Total Project Duration: 7 months (November 2025 - July 2026)

Phase 1 - Graduation Project I (November 2025 - January 2026):

- Weeks 1-4: Requirements analysis and stakeholder interviews
- Weeks 5-8: System design and architecture
- Weeks 9-11: Design documentation and review
- **Milestone:** Requirements and Design Document Submitted (January 15, 2026)

Phase 2 - Graduation Project II (February 2026 - June 2026):

- Weeks 12-15: Authentication and core infrastructure (Sprint 1)
- Weeks 16-19: Course management and transfer modules (Sprints 2-3)
- Weeks 20-23: Matching engine and reports (Sprints 4-5)
- Weeks 24-26: Testing and deployment (Sprint 6)
- **Milestone:** System Go-Live (June 15, 2026)

Critical Deadlines:

- December 15, 2025: Requirements Specification Complete
- January 15, 2026: Graduation Project I Submission
- March 15, 2026: Core Modules Operational
- April 15, 2026: Matching Engine Complete
- May 10, 2026: User Acceptance Testing Complete
- May 2026: Final Presentation and Handover

Flexibility: Schedule includes 2-weeks buffer before final deadline to accommodate unexpected delays. Sprint duration of 2 weeks allows for iterative development and frequent feedback from supervisors.

10.0 Potential Risks

The project may face several risks, including:

- Possible inaccuracy in the course matching algorithm.
- Lack of complete or clear course data from external universities.
- Technical challenges during system development.
- Potential delays in the project schedule.
- User resistance or low trust in automated decisions.
- Security and data privacy concerns.
- System usability issues.
- Changes in academic policies that may affect system rules.

11.0 Exhibits

will be added later and will include system diagrams, sample data, screenshots, and testing results once development is completed.