

Aurex Exam Generator - Complete User Manual

Version: 1.0.0

Built with: Next.js, Python Flask

License: Academic Use

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Overview

Aurex Exam Generator is a comprehensive desktop application designed for educators to create, manage, and generate professional exam papers. The system provides intelligent features including grammar checking, duplicate question detection, similarity analysis, and automated document generation.

Key Features

- **Excel Question Bank Processing** - Upload and parse structured question banks
- **Advanced Grammar Checking** - Integrated LanguageTool grammar validation

- **Intelligent Duplicate Detection** - AI-powered similarity analysis
 - **Question Editor** - Interactive editing with real-time validation
 - **Multiple Question Types** - Support for MCQ, True/False, Matching, and Written questions (Short/Long)
 - **Document Generation** - Automated Word document creation for exams and answer keys
 - **Image Support** - Upload and embed images in questions
 - **Template Management** - Custom Word document templates
 - **Local Processing** - All data processed locally for security
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System Requirements

Prerequisites

- **Operating System:** Windows 10/11, macOS 10.15+, or Linux Ubuntu 18.04+
- **Python:** Version 3.8 or higher
- **Node.js:** Version 18 or higher (LTS recommended)
- **Java (optional):** JDK 17 / OpenJDK / Temurin JDK 11 or 17+ (recommended for grammar checking)
- **Memory:** Minimum 4GB RAM (8GB recommended)
- **Storage:** At least 2GB free space
- **Internet:** Required for initial setup and grammar checking service

Browser Compatibility

- Google Chrome (recommended, latest)
 - Microsoft Edge (chromium-based, latest)
-

Installation

Git Hub Link - <https://github.com/juliaizbroke/SeniorProject1>

Windows Installation (Recommended)

Method 1: Automated Setup (Recommended)

1. **Download and extract the project (ZIP file)** to your desired location
2. **Navigate to project folder:** "C:\path\to\SeniorProject1"
3. **Run (Double-click) the setup script:** setup-and-run.bat

The script will automatically:

- Check Python and Node.js installation
- Create Python virtual environment
- Install all backend dependencies
- Install frontend dependencies
- Start both servers
- Open the application in your browser

Method 2: Manual Installation

If the automated script fails, follow these steps:

1. **Install Python 3.8+**
 - Download from [python.org](https://www.python.org)
 - **⚠️ Important:** Check "Add Python to PATH" during installation
2. **Install Node.js 18+**
 - Download LTS version from nodejs.org
 - This includes npm package manager
3. **Install JDK 17+**
 - Download from [Adoptium Temurin](https://adoptium.net/) or [Oracle JDK](https://www.oracle.com/java/technologies/javase-jdk-downloads.html)

- **⚠️ Important:** Set `JAVA_HOME` and add bin folder to `PATH`
4. **Open 2 command prompts (1 for backend & 1 for frontend)** in the project folder.
 5. **Setup Backend:**
 - `cd backend`
 - `python -m pip install --upgrade pip`
 - `pip install -r requirements.txt`
 6. **Setup Frontend:**
 - `cd frontend`
 - `npm install OR pnpm install`
-

Quick Start Guide

First-Time Users

1. **Run Setup:**
 - Windows: Double-click `setup-and-run.bat`
2. **Wait for Services:**
 - Backend starts on `http://localhost:5001`
 - Frontend opens at `http://localhost:3000`
 - First startup takes 15-20 seconds (LanguageTool initialization)
3. **Access Application:**
 - Browser should open automatically
 - If not, manually navigate to `http://localhost:3000`

Subsequent Use

For faster startup after initial setup: Double-click `quick-start.bat`

This skips dependency installation and starts servers directly.

Basic Workflow

1. **Upload Question Bank** - Excel file with structured questions
 2. **Review Questions** - Grammar errors highlighted automatically
 3. **Handle Duplicates** - Resolve any detected duplicate questions
 4. **Edit Questions** - Make necessary corrections using the editor
 5. **Generate Documents** - Create exam papers and answer keys
-

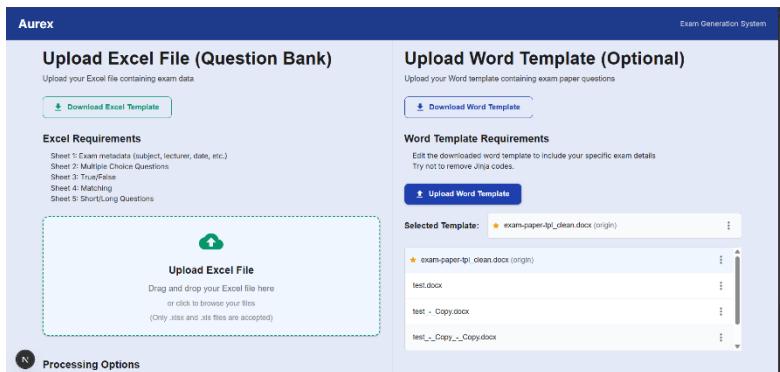
User Interface Guide

Landing Page



- **Get Started Button** - Navigate to main application

Home Page Features



The screenshot shows the software's user interface divided into three main sections:

- Excel Requirements:** Contains a "Download Excel Template" button and a list of requirements for exam metadata (Sheet 1) and question types (Sheets 2-5).
- Word Template Requirements:** Contains a "Download Word Template" button and instructions for editing the template.
- Processing Options:** Includes checkboxes for "Enable Duplicate Detection" and "Enable Grammar Checking", and a "Upload and Process" button.

A central progress bar indicates "Processing Excel File" with a status message "Reading questions and validating format...". A "Did You Know?" section provides information about question types.

File Upload Section

- **Download Template** - Download Excel template
 - **In Case** - get manually from
C:\..\SeniorProject1\backend\processing\templates\download
- **Drag & Drop Area** - Upload Excel question bank files
- **Progress Tracking** - Real-time upload progress
- **File Validation** - Automatic format checking

Processing Options

- **Enable Duplicate Detection** - AI-powered similarity analysis
- **Enable Grammar Checking** - LanguageTool integration

Word Template Management

- **Download Template** - Download Excel template
- **Default Templates** - Built-in exam paper templates
- **Custom Upload** - Upload your own Word document templates
- **Template Selection** - Choose active template for document generation

Navigation Pages

The screenshot shows the 'Select Categories' page of the Exam Generation System. At the top, there's a header bar with the 'Aurex' logo and 'Exam Generation System'. Below the header, the title 'Select Categories' is displayed. A sub-header says 'Choose the number of questions from each category to include in your exam.' A yellow warning box at the top right says 'Possible Duplicate Questions Detected' with the note '6 duplicate groups identified. They will be highlighted during editing so you can decide which to keep or modify.' The 'Exam Details' section contains fields for Year (2025), Semester (1), Exam Type (MIDTERM), Exam Type Code (MIDTERM_12345), Department (Magical Food), Program Type (Undergraduate), Subject Code (ABC1234), Subject Name (Home Cooking), Lecturer (Harry Potter), Date (10th June 2025), and Time (09:00 AM - 12:00 PM). The main area is titled 'Question Selection by Category' and lists categories: 'Multiple Choice', 'True/False', 'Matching', and 'Written Questions'. Under 'Multiple Choice', there are three rows: 'food' (Available: 2, Select: 2), 'places' (Available: 2, Select: 2), and 'animal' (Available: 4, Select: 0). A blue button at the bottom right says 'APPLY FILTERS'.

Category Selection (/category)

- **Question Type Distribution** - View questions by category
- **Question Count** - Statistics for each question type
- **Navigation Controls** - Proceed to editing

Question Editor (/edit)

The screenshot shows the 'Edit Questions' page of the Exam Generation System. The title 'Edit Questions' is at the top, followed by a sub-header 'Review and edit your exam questions before generating the final documents.' A yellow warning box at the top right says 'Duplicate Question Groups Detected' with the note 'Review similar questions using the floating action button or inline indicators. You can merge, replace, or ignore duplicates as needed.' Below the warning, there are tabs for 'Multiple Choice', 'True/False', 'Matching', and 'Written'. A red box highlights the 'Multiple Choice' tab. The main area shows a group of questions titled 'Duplicate Question Groups (3 groups)'. One group is shown: 'Group 1 (2 questions)' containing a question: 'Which of the following is a fruit?'. The options are: A. Pork, B. Beef, C. Basil, and D. Apple. Option D is selected. A red circle with a checkmark is on the left of the first option. A red button at the top right of the group says 'Very High (99%)'.

Aurex Exam Generation System

Edit Questions

Review and edit your exam questions before generating the final documents.

Duplicate Question Groups Detected

Review similar questions using the floating action button or inline indicators. You can merge, replace, or ignore duplicates as needed.

Multiple Choice TrueFalse Matching Written X SHUFFLE QUESTIONS

Do chairs typically have four legs?
Category: none
Answer: T

Please resolve all duplicate question groups before generating the exam.

- **Grammar Error Highlighting** - Visual indicators
- **Duplicates Handling** – Keep one or ignore duplicate questions
- **Image Upload** - Add images to questions
- **Question Type Management** - Handle MCQ, T/F, Matching, Written questions (Short/Long)

Preview (/preview)

Aurex Exam Generation System

Preview Exam

Review your exam content and structure before downloading the final documents.

Subject: Home Cooking Lecturer: Harry Potter Date: 10th June 2025 Duration: 09:00 AM - 12:00 PM

Exam Paper Answer Key

Home Cooking
Final Examination
Date: 10th June 2025 Duration: 09:00 AM - 12:00 PM
Lecturer: Harry Potter

Question Selection

8 Multiple Choice 1 TrueFalse 2 Matching 4 Written

Section A: Multiple Choice Questions (8 points)

1. Which of the following is a fruit?
 A. Pork
 B. Beef
 C. Basil
 D. Apple
 E. None of the Above

Category: food

2. Which of these animals lives in water?
 A. Camel

2. Describe your favourite place.

3. List two common ingredients used in a healing potion.

4. Describe the process of constructing a defensive enchantment, including necessary spells, materials, and safety precautions.

GENERATE PAPER →

BACK TO HOME **UPLOAD EXCEL AGAIN**

2. Describe your favourite place.

3. List two common ingredients used in a healing potion.

4. Describe the process of constructing a defensive enchantment, including necessary spells, materials, and safety precautions.

DOWNLOAD EXAM PAPER **DOWNLOAD ANSWER KEY**

BACK TO HOME **UPLOAD EXCEL AGAIN**

- **Document Preview** - View generated exam papers
- **Answer Key Preview** - Review answer key format
- **Download Options** - Direct download buttons
 - **In Case Field Values are not updated:** Open downloaded Word exam paper and press **CTRL + A + F9**

Landing Page

🔍 Similarity Checking

Maintain exam integrity with intelligent similarity detection. Compare multiple exam papers to identify duplicates, ensure consistency, and uphold academic standards across all assessments.

How It Works

1

Upload Papers

Upload multiple exam papers in PDF, DOCX, or XLSX format for comprehensive comparison.

2

Analyze Content

Advanced algorithms analyze text patterns, structure, and content similarity.

3

Get Results

Receive detailed similarity reports with highlighted matches and insights.

Key Features

- Content Similarity Detection
- Customizable Similarity Thresholds
- Multiple File Format Support
- Detailed Analysis Reports
- Batch Processing Capabilities
- Export Functionality

Start Similarity Check

- Start Similarity Check Button - Navigate to similarity check page

Similarity Check (/similarity)

Exam Papers Similarity Checker

Upload multiple Word documents (.docx) to analyze content similarity between exam papers.
Our system will compare the documents and identify potential duplicates or overlapping content.

Upload Exam Papers

Drag and drop your Word documents here
or click to browse your files
(Only .docx files are accepted)

Analyze Similarity

Aurex Exam Generation System

Similarity Analysis Results

Analysis completed for 4 documents. Click on any cell in the matrix to view detailed comparison results.

Risk Level Guide

Risk Level	Similarity Range	Interpretation
High Risk	≥ 75%	Documents contain mostly exact duplicates and/or multiple highly similar questions. Review carefully — likely content overlap.
Medium Risk	50–74%	Documents have some exact duplicates but also a significant portion of partial matches. Moderate similarity; some overlap, but most may be acceptable.
Low Risk	< 50%	Few exact duplicates; most questions are unique. Low chance of problematic overlap; mostly original content.

Similarity Matrix

Documents	exam1	exam2	exam3	exam4
exam1	100.0%	41.5% Low/Medium	35.4% Low	31.6% Low
exam2				
exam3				
exam4				

Detailed Comparison: exam1.docx vs exam3.docx

Risk Level Guide

Risk Level	Similarity Range
High Risk	≥ 75%
Medium Risk	50–74%
Low Risk	< 50%

Analysis Context

Low Risk (<50%): Few exact duplicates; most questions are unique. Low chance of problematic overlap; mostly original content.

Perfect Matches (6) High Risk

These questions are identical or nearly identical between the two documents:

Processing Time: 0.009s
Questions Found: 9 matching pairs detected

- **Drag & Drop Area** - Upload multiple Word exam papers (old questions)
 - **Analysis Results** - Matrix of similarities with interactive cells
 - **Similarity Scores** - Numerical similarity ratings
-

Troubleshooting

Installation Issues

Problem: "Python is not installed" error

Solution:

1. Download Python 3.8+ from python.org
2. **CRITICAL:** Check "Add Python to PATH" during installation
3. Restart Command Prompt/Terminal
4. Verify with: python --version

Problem: "Node.js is not installed" error

Solution:

1. Download Node.js LTS from nodejs.org
2. Install with default settings
3. Restart Command Prompt/Terminal
4. Verify with: node --version and npm --version

Problem: "Java is not installed" error

Solution:

1. Download JDK 17+ from [Adoptium Temurin](#) or [Oracle JDK](#)
2. **CRITICAL:** Set JAVA_HOME and "Add bin to PATH"
3. Restart Command Prompt/Terminal
4. Verify with: java -version

Problem: "Dependencies" error

Solution:

```
# Ensure pip is updated  
python -m pip install --upgrade pip  
  
# Install dependencies  
pip install -r backend/requirements.txt
```

Runtime Issues

Problem: Application window is blank

Solutions:

1. Wait 15-20 seconds for backend initialization
2. Refresh browser with Ctrl+R (Windows) or Cmd+R (macOS)
3. Check browser console for error messages
4. Verify both servers are running in terminal windows

Problem: "Port already in use" error

Solutions:

1. Close any other instances of the application
2. Kill processes using ports 3000 and 5001:
 3. # Windows
 4. netstat -ano | findstr :3000
 5. netstat -ano | findstr :5001
 6. taskkill /PID <process_id> /F
 - 7.
 8. # macOS/Linux
 9. lsof -ti:3000 | xargs kill -9
 10. lsof -ti:5001 | xargs kill -9
11. Restart your computer if issue persists

Problem: Grammar checking is slow or fails

Solutions:

1. **First startup:** LanguageTool downloads ~300MB data (one-time)
2. **Subsequent use:** Should be much faster
3. **Connection issues:** Ensure internet connectivity
4. **Firewall:** Allow Python applications through firewall
5. **Antivirus:** Whitelist the project directory

Problem: File upload fails

Solutions:

1. **File format:** Ensure Excel file (.xlsx) format
2. **File size:** Check file is under reasonable size limit
3. **Permissions:** Ensure read permissions on file
4. **Antivirus:** Temporarily disable real-time scanning
5. **Disk space:** Ensure sufficient free space in project directory

Problem: Generated documents are corrupted

Solutions:

1. **Template issues:** Try using default template
2. **Permissions:** Ensure write permissions in output directory
3. **Antivirus:** Whitelist output directory
4. **Dependencies:** Reinstall Python packages:
5. pip install --force-reinstall python-docx docxtpl

Performance Issues

Problem: Slow duplicate detection

Solutions:

1. **Memory usage:** Close other applications
2. **Hardware:** Use machine with more RAM if available

3. **Optimization:** Process smaller batches of questions

Problem: High memory usage

Solutions:

1. **Cleanup:** Regularly use cleanup functions in app
2. **Restart:** Restart application periodically for large workflows
3. **Monitoring:** Use Task Manager/Activity Monitor to track usage

Network Issues

Problem: Cannot access localhost:3000

Solutions:

1. **Wait longer:** Frontend takes time to compile and start
2. **Port conflict:** Try alternative port:
 - cd frontend
 - npm run dev -- --port 3001
3. **Firewall:** Configure firewall to allow local connections
4. **Browser cache:** Clear browser cache and cookies

Problem: Backend API calls fail

Solutions:

1. **Backend status:** Verify backend is running on port 5001
2. **CORS issues:** Check browser console for CORS errors
3. **Environment:** Verify .env.local has correct backend URL
4. **Network:** Disable VPN or proxy if active

Data Issues

Problem: Excel file parsing fails

Solutions:

1. **Format validation:** Use provided Excel templates
2. **Sheet names:** Ensure "Info" and other Questions sheets exist

3. **Data integrity:** Check for empty cells in required columns
4. **Encoding:** Save Excel file with UTF-8 encoding
5. **Version:** Use Excel 2016+ or LibreOffice Calc

Problem: Generated documents missing content

Solutions:

1. **Template variables:** Verify template contains required placeholders
 2. **Question data:** Check question parsing completed successfully
 3. **Image paths:** Ensure image files are accessible
 4. **Metadata:** Verify Info sheet contains all required fields
-

FAQ

General Questions

Q: Is my data secure? A: Yes! All processing happens locally on your computer. No data is sent to external servers except for grammar checking via LanguageTool, which only processes text snippets for validation.

Q: Can I use this offline? A: Partially. The application works offline except for grammar checking, which requires internet connectivity for LanguageTool service.

Q: What file formats are supported? A: **Input:** Excel (.xlsx), Word templates (.docx), Images (JPEG, PNG) **Output:** Word documents (.docx), HTML previews

Q: How many questions can I process at once? A: The system can handle hundreds of questions, but performance depends on your hardware. For best results, process 50-200 questions at a time.

Q: Can I customize the exam paper format? A: Yes! Upload your own Word document templates with custom formatting, headers, footers, and styling. However, we kindly advise that if you are not familiar with Jinja codes, please avoid removing or editing them to ensure everything works smoothly.

Technical Questions

Q: Why is the first upload slow? A: LanguageTool downloads language models (~300MB) on first use. Subsequent uses are much faster as models are cached locally.

Q: Can I run this on a server? A: While technically possible, the application is designed for desktop use. Server deployment would require additional configuration and security considerations.

Q: How accurate is the duplicate detection? A: The similarity detection is highly accurate, using semantic analysis rather than simple text matching.

Q: Can I batch process multiple Excel files? A: Currently, the system processes one Excel file at a time. You can combine multiple question banks into a single Excel file for processing.

Usage Questions

Q: How do I create the Excel question bank? A: Use the provided Excel templates or follow the structure documented in this manual. Include "Info" and other Question Types sheets with proper column headers.

Q: Can I add images to questions? A: Yes! Use the image upload feature in the question editor to add visual elements to any question type.

Q: How do I handle grammar suggestions? A: Grammar errors are highlighted in yellow in editing page. Use the question editor to review and apply suggestions manually.

Troubleshooting Questions

Q: The application won't start. What do I do? A: 1) Verify Python and Node.js are installed, 2) Run as Administrator on Windows, 3) Check antivirus isn't blocking, 4) Try manual installation steps.

Q: Generated Word documents won't open. A: This usually indicates a template or formatting issue. Try using the default template first, then check your custom template for errors.

Q: Images aren't showing in generated documents. A: Ensure images are uploaded through the application and paths are correctly referenced. Check that image files haven't been moved or deleted.

Version History and Changelog

Version 1.0.0 (Current)

- **Initial Release** - Complete exam generation system
- **Core Features** - Excel parsing, grammar checking, duplicate detection
- **Document Generation** - Word paper and answer key creation
- **Template System** - Custom Word document templates
- **Image Support** - Question image upload and embedding
- **Web Interface** - Responsive Next.js frontend
- **Local Processing** - Privacy-focused local data handling

Planned Enhancements

- **Performance Optimization** - Faster processing for large question banks
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License and Legal

Academic Use License

This software is provided for educational and academic purposes. Commercial use requires separate licensing agreement.

Third-Party Dependencies

- **LanguageTool** - Grammar checking service
- **Flask** - Web framework (BSD License)
- **React/Next.js** - Frontend framework (MIT License)
- **Material-UI** - Component library (MIT License)
- **pandas** - Data processing (BSD License)
- **python-docx** - Document generation (MIT License)

Data Privacy

- All question data are processed locally

- Grammar checking sends only text snippets to LanguageTool
- No personal data transmitted to external servers
- Temporary files automatically cleaned up

Security Notice

- Run only on trusted networks
 - Scan uploaded files for malware
 - Keep dependencies updated for security patches
 - Use antivirus software for additional protection
-

Contact Information

Development Team – The Three Must-code-tears

- **Project Name:** Senior Project 1 (CSX3010-SP1)
- **Institution:** AU (Academic University)
- **Academic Year:** 3rd Year, 2nd Semester
- **Project Advisor:** Asst. Prof. Dr. Rachsuda Setthawong
- **Team Members**
 - 6530207 – Zwe La Pyae (CS)
 - 6530213 – Thet Myat Noe Thwin (CS)
 - 6530203 – Khant Min Lwin (IT)

Technical Support

For technical assistance with Aurex Exam Generator:

1. Check this user manual thoroughly
2. Review troubleshooting section
3. Contact development team with detailed error information
4. Include system specifications and steps to reproduce issues

Thank you for using Aurex Exam Generator!

This manual is comprehensive and covers all aspects of the system. For the most up-to-date information, always refer to the latest version of this documentation.

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