



# **CAPSTONE PROJECT REPORT**

## **Report 6 – Software User Guides**

– Ho Chi Minh City, December 2025–

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# I. Project Report

## 1. Status Report

#	Work Item	Status	Notes (Work Item in Details)
1	Delivery packages	Completed	
2	Installation Guides	Completed	
3	User Manual	Completed	

## 2. Team Involvements

#	Task	Member	Notes (Task Details, etc.)
1	User Manual	NhatDM	
2	Installation Guides	KhoiPD	
3	Delivery packages	DucDT	

# II. Release Package & User Guides

## 1. Deliverable Package

### 1.1 Source codes & documents

No.	Items	Sub-Items	Type	Version
<b>Code Package</b>				
1	LSSCTC Backend API	Web Service	Modify	10.5
2	LSSCTC Frontend Web App	User Web Application	Modify	9.3
3	LSSCTC Simulator Desktop App	User Desktop Application	Modify	3.0
<b>Database</b>				
1	Tables	lssctc_db_script.sql	Modify	N/A
<b>Documents</b>				
1	Project Introduction	Report1_Project Introduction.docx	Modify	1.0
2	Project Management Plan	Report2_Project Management Plan.docx	Modify	1.0
3	Software Requirement Specification	Report3_Software Requirement Specification.docx	Modify	1.0
4	Software Design Document	Report4_Software Design Document.docx	Modify	1.0
5	Test Documentation	Report5_Test Documentation.docx	Modify	1.0
6	Software User Guides	Report6_Software User Guides.docx	Modify	1.0
7	Final Project Report	Report7_FinalProjectReport.docx	Modify	1.0

### 1.2 Known Issues, Limitations & Restrictions

- npm install fails: Delete the node\_modules folder and package-lock.json file, then run npm install again.

- Port 5173 already in use: Stop the process currently using the port or change the port number in the vite.config.js file.
- API calls fail with CORS error: Verify that the backend server is running and configured to accept requests from http://localhost:5173.
- Google OAuth not working: Ensure the Client ID in the .env file is correct and the Redirect URIs in the Google Cloud Console match your local URL.
- Blank page appears after loading: Open the browser developer tools console to check for JavaScript errors or missing environment variables.
- Module not found errors: Run npm install again to ensure all required dependencies are downloaded.

## 2. Installation Guides

### 2.1 System Requirements

#### 2.1.1 Hardware Requirements

Component	Minimum	Recommended
CPU	At least 2 GHz x64-bit CPU	Intel Core I5, 4GHz
Memory	At least 8GB RAM	16GB RAM
Storage	10GB SSD	15GB SSD
Network	Internet Connection	500 Mbps

Table 1: Hardware Requirements

#### 2.1.2 Software Requirements

Component	Software & Version	Description
Operating System	Windows 10/11, macOS 10.15+, or Linux (Ubuntu 20.04+)	Operating system for running project
DBMS	SQL Server 2019 or Azure SQL Database	Database management system
Server Environment	.NET 8.0 SDK	Environment for running backend API
Frontend Environment	Node.js 18.17.0 or higher	Environment for running frontend application
Package Manager	NPM 9.x or higher	Package manager for frontend dependencies
IDE	Visual Studio Code 1.80+ or Visual Studio 2022	Tool for viewing and editing code
VCS	Git 2.30+	Tool for managing code version
Web Browser	Chrome 90+, Firefox 88+, Edge 90+, or Safari 14+	Browser for accessing web application
Database Tool	SQL Server Management Studio (SSMS) 19+ or Azure Data Studio	Tool for database management

**Table 2: Software Requirements**

## **2.2 Setup Files**

### **2.2.1 Database Files**

- **lssctc\_db-script.sql:** Complete database schema script for SQL Server
- **seed-data.sql:** Initial seed data for system (users, roles, course categories, etc.)

### **2.2.2 Backend Files**

- **lssctc-api.zip:** Complete backend API solution
  - Contains: Controllers, Services, Models, Repositories, and Configuration files
  - Main project: Lssctc.ProgramManagement
  - Shared library: Lssctc.Share

### **2.2.3 Frontend Files**

- **lssctc-web.zip:** Complete frontend web application
  - Contains: React components, Pages, Routes, Layouts, and Assets
  - Main entry: src/main.jsx
  - Configuration: vite.config.js, package.json

### **2.2.4 Configuration Files**

- **appsettings.json:** Backend API configuration (connection strings, JWT settings)
- **appsettings.Development.json:** Development-specific settings
- **.env.example:** Frontend environment variables template

## **2.3 Installation Instruction**

### **2.3.1 Setup Environment**

#### **Step 1: Install Required Software**

- **Download and Install .NET 8.0 SDK**
  - Visit: <https://dotnet.microsoft.com/download/dotnet/8.0>
  - Download .NET 8.0 SDK for your operating system
  - Run installer and follow installation wizard
- **Download and Install Node.js 18.17.0 or higher**
  - Visit: <https://nodejs.org/>
  - Download LTS version (18.17.0 or newer)
  - Run installer and follow installation wizard
- **Download and Install SQL Server 2019**
  - Visit: <https://www.microsoft.com/en-us/sql-server/sql-server-downloads>
  - Download SQL Server 2019 Developer Edition (free)

- Run installer and follow installation wizard
- Configure authentication mode: **Mixed Mode** (SQL Server and Windows Authentication)
- Verify installation using SQL Server Configuration Manager

- **Download and Install SQL Server Management Studio (SSMS)**

- Visit: <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms>
- Download latest version
- Run installer and follow installation wizard
- Launch SSMS and connect to local SQL Server instance

- **Download and Install Visual Studio Code**

- Visit: <https://code.visualstudio.com/>
- Download for your operating system
- Install recommended extensions

- **Download and Install Git**

- Visit: <https://git-scm.com/downloads>
- Download for your operating system
- Run installer with default options

### **Step 2: Configure Git**

- Set your name and email
- Verify configuration

### **Step 3: Clone Repositories**

- Create project directory
- Clone backend repository
- Clone frontend repository
- Clone simulation application repository

### **2.3.2 Setup Database**

#### **Step 1: Create Database**

- Open **SQL Server Management Studio (SSMS)**
- Connect to your local SQL Server instance
- Right-click on **Databases** → Select **New Database**
- Database name: `lssctc_db`

- Click **OK**

### **Step 2: Execute Database Script**

- Open **lssctc\_db-script.sql** in SSMS
  - File → Open → File → Select lssctc\_db-script.sql
- Ensure lssctc\_db database is selected in database dropdown
- Click **Execute** button or press F5
- Wait for script execution to complete
- Verify tables are created:
- Expected output: 40+ tables including users, roles, courses, classes, quizzes, etc.

### **Step 3: Execute Seed Data (Optional)**

- Open **seed-data.sql** in SSMS
- Execute script to populate initial data:
  - Default admin account
  - Course categories and levels
  - Course and class codes
  - Material types
- Verify seed data

### **Step 4: Verify Database Connection String**

- Your server name
- Database name: lssctc\_db
- Authentication: SQL Server Authentication or Windows Authentication
- Example connection string:
  - Server=localhost;Database=LSSCTC\_DB;User Id=sa;Password=YourPassword;TrustServerCertificate=True

## **2.3.3 Setup and Run Backend API**

### **Step 1: Navigate to Backend Project**

- cd lssctc-project/lssctc-api/Lssctc/Lssctc.ProgramManagement

### **Step 2: Configure Application Settings**

- Open **appsettings.json** in text editor or VS Code
- Update your custom value for: "ConnectionStrings", "JwtConfig", "EmailSettings"
- **Generate JWT Secret Key** (recommended):
  - Generate random 32-character key using PowerShell (Windows)

- Generate random 32-character key using openssl (macOS/Linux)
- **Configure Email Settings** (for OTP functionality):
  - Use Gmail account
  - Enable 2-Factor Authentication
  - Generate App Password: <https://myaccount.google.com/apppasswords>
  - Use App Password in configuration (not your Gmail password)

### **Step 3: Restore NuGet Packages**

- Restore all dependencies
  - dotnet restore

### **Step 4: Build Project**

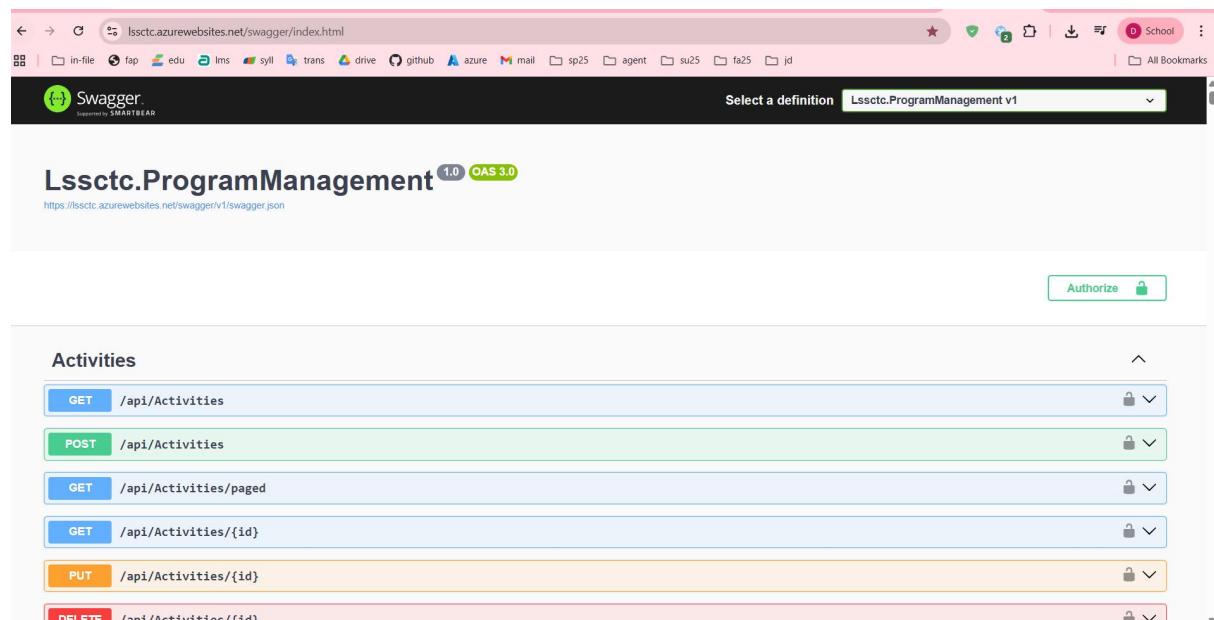
- Build project
  - dotnet build
  - Expected output: Build succeeded.

### **Step 5: Run Backend API**

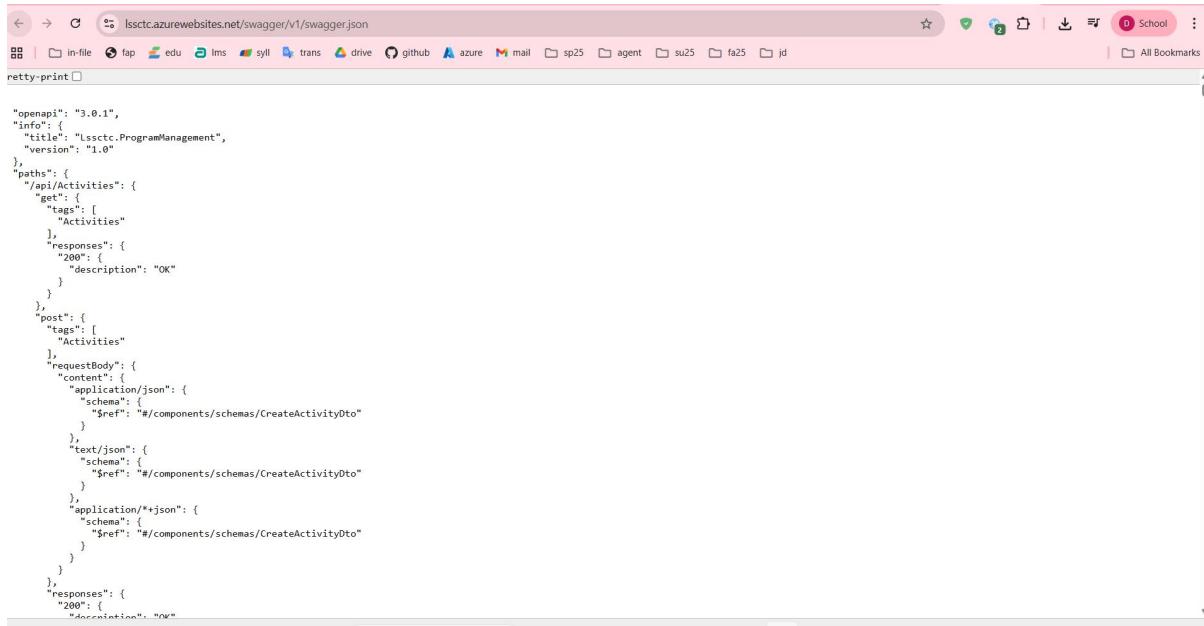
- Run in development mode
  - dotnet run

### **Step 6: Verify API is Running**

- Open web browser
- Navigate to default port
- If you setup the project to display the Swagger UI in production environment (recommend for testing only), you should see this page with all API endpoints



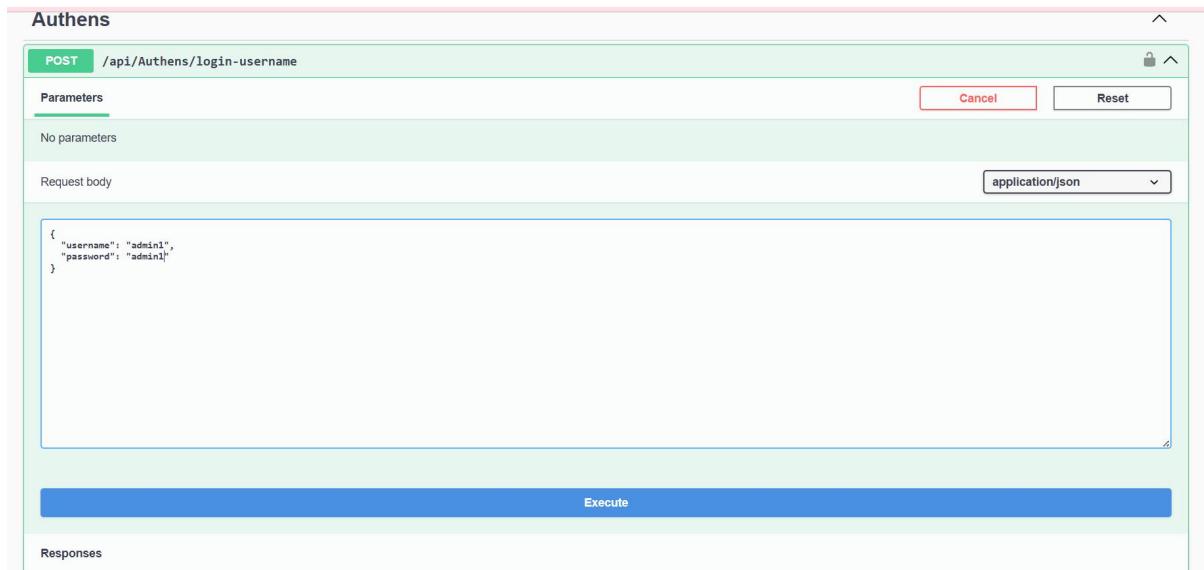
Or a json format:



```
openapi: "3.0.1"
info: {
  title: "Lssctc.ProgramManagement",
  version: "1.0"
}
paths: {
  "/api/Activities": {
    "get": {
      "tags": [
        "Activities"
      ],
      "responses": {
        "200": {
          "description": "OK"
        }
      }
    },
    "post": {
      "tags": [
        "Activities"
      ],
      "requestBody": {
        "content": {
          "application/json": {
            "schema": {
              "$ref": "#/components/schemas/CreateActivityDto"
            }
          },
          "text/json": {
            "schema": {
              "$ref": "#/components/schemas/CreateActivityDto"
            }
          },
          "application/*+json": {
            "schema": {
              "$ref": "#/components/schemas/CreateActivityDto"
            }
          }
        }
      },
      "responses": {
        "200": {
          "description": "OK"
        }
      }
    }
  }
}
```

#### 4. Test authentication endpoint:

- Expand **POST /api/Authens/login-username**
- Click **Try it out**
- Enter test credentials (if seeded)
- Click **Execute**
- Verify 200 OK response with JWT token



The screenshot shows the Swagger UI interface for the 'Authens' endpoint. The URL is `POST /api/Authens/login-username`. The 'Parameters' section is empty, showing 'No parameters'. The 'Request body' section has a dropdown set to 'application/json' and contains the following JSON payload:

```
{
  "username": "admin1",
  "password": "admin1"
}
```

At the bottom, there is a large blue 'Execute' button.

#### 2.3.4 Setup and Run Frontend Web Application

This section outlines how to configure, run, and verify the frontend client interface.

##### Step 1: Installation

- Navigate to the project directory and install the required dependencies.

## Step 2: Environment Configuration

- Set up the connection to the backend and external services.
  - Create the configuration file (.env)
  - Edit the .env file with your own configuration (backend endpoints, service keys)
- Google OAuth Setup To enable "Sign in with Google," create a project in the Google Cloud Console:
  - Type: OAuth 2.0 Web Application
  - Origin: http://localhost:5173
  - RedirectURI: http://localhost:5173/auth/callback
  - Paste the generated Client ID into your .env file.

## Step 5: Production Build (Optional)

- To prepare the application for final deployment:
- Build: Run npm run build to generate the dist/ folder.
- Preview: Run npm run preview to test the build at http://localhost:5173.

### 2.3.5 Deployment to Production

#### Backend Deployment Options:

##### Option 1: Deploy to Azure App Service

1. Install Azure CLI
2. Login to Azure
3. Create App Service:
4. Deploy with dotnet publish option
5. Access Azure Portal and navigate to your app service
6. Configure connection string in Azure Portal
7. Update environment variable settings

##### Option 2: Deploy to Docker Container

1. Create Dockerfile in backend project root with publish option
2. Build and run
3. Access Docker application to view your running projects.

#### Frontend Deployment Options:

##### Option 1: Deploy to Vercel

1. Create an account in vercel.com (or using an existed one)
2. Connect your Vercel account with github repository

3. Create a new Vercel project
4. Setup deployment configuration
5. Configure environment variables in Vercel dashboard
6. Confirm deployment and view the project in Vercel dashboard
7. Vercel project will automatically update after change in github repository

#### **Option 2: Deploy to Azure Static Web Apps**

1. Create a Azure account in Azure Portal (or using an existed one)
2. In Azure Portal, create a new resource
3. Select Static Web App
4. Setup your github repository of frontend project (or using a zip file)
5. Azure will automatically build and deploy your web app

#### **Database Deployment:**

##### **Deploy to Azure SQL Database**

1. Create Azure SQL Database in Azure Portal
2. Connect to Azure SQL Database using SSMS
3. Execute script to create tables and seed data
4. Update backend environment variables to match your database

### **3. User Manual**

#### **3.1 Terms and definitions**

Term	Definition
LSSCTC	Learner Management and 3D Simulation System for Crane Training Center
Admin	System administrator with full access to all features and user management
Instructor	Teacher/trainer who creates course content, quizzes, and evaluates trainees
Trainee	Student enrolled in crane operation training courses
Program Manager	Role responsible for curriculum design and course orchestration
Simulation Manager	Role responsible for managing 3D simulation components and scenarios
Training Program	Complete curriculum consisting of multiple courses leading to certification

Course	Individual training module covering specific crane operation topics
Section	Subdivision within a course containing organized activities
Activity	Learning task within a section (material, quiz, or practice)
Learning Material	Educational content (PDF, video, image, URL) provided to trainees
Quiz	Assessment containing multiple-choice or single-choice questions
Practice	Hands-on simulation task for skill development and evaluation
Class	Group of trainees enrolled in a program with scheduled sessions
Timeslot	Scheduled session for class instruction with date, time, and instructor
Enrollment	Trainee's registration and participation in a specific class
Activity Record	Trainee's progress and completion status for an activity
Quiz Attempt	Trainee's submission of a quiz with scored results
Practice Attempt	Trainee's completion of a practice session with performance metrics
Simulation Component	3D model or asset used in crane operation simulation environment
Brand Model	Specific crane manufacturer and model configuration
JWT	JSON Web Token - authentication token for API access
OTP	One-Time Password - 6-digit code for password reset verification
WebGL	Web Graphics Library - browser technology for 3D rendering

### 3.2 System requirements

For End Users (Trainees, Instructors):

- Operating System:
  - Windows 10/11 (64-bit)
  - macOS 10.15 (Catalina) or later
  - Linux (Ubuntu 20.04+ or equivalent)
- Web Browser:
  - Google Chrome 90+ (Recommended)
  - Mozilla Firefox 88+
  - Safari 14+ (macOS only)

- Microsoft Edge 90+
- Internet Connection:
  - Minimum: 5 Mbps (for video streaming and general use)
  - Recommended: 10 Mbps (for 3D simulation)
- Display Resolution:
  - Minimum: 1366x768
  - Recommended: 1920x1080 or higher
- Input Devices:
  - Mouse and keyboard (required)
  - Trackpad supported but not recommended for simulation

For Simulation Features:

- RAM:
  - Minimum: 8GB
  - Recommended: 16GB
- Graphics Card:
  - Dedicated GPU with WebGL 2.0 support
  - NVIDIA GTX 1050 or equivalent
  - AMD Radeon RX 560 or equivalent
- Storage:
  - 2GB free space for cached 3D models and textures
- CPU:
  - Minimum: Intel Core i5 or AMD Ryzen 5
  - Recommended: Intel Core i7 or AMD Ryzen 7

For System Administrators:

- All of the above, plus:
- Access to SQL Server Management Studio or Azure Data Studio
- Network access to application server and database server

Remote desktop or SSH access to servers (for on-premise deployment)

### **3.3 Application Usage**

#### **3.3.1 Overview**

The LSSCTC system is a web-based Learning Management System integrated with 3D crane operation simulation capabilities. It consists of:

1. Frontend (Web Application): React-based single-page application
2. Backend (API): .NET 8 RESTful API with JWT authentication
3. Database: SQL Server relational database
4. 3D Engine: Desktop application (.exe file) or WebGL-based environment

#### **3.3.2 Feature 1: Authentication & User Management**

Purpose: Secured user authentication with multiple login methods and role-based access control

Available Functions:

1. Login with Username/Password
2. Login with Google account
3. Password Reset
4. Logout
5. Manage Personal Profile
6. Manage User (Admin role)
  - a. Add User
  - b. Edit User information

### **3.3.3 Feature 2: Program & Course Management**

Purpose: Create, organize, and manage training program and courses

Available Functions:

1. View all Training Programs

#	HÌNH ANH	TÊN CHƯƠNG TRÌNH	KHÓA HỌC	NGÀY TẠO	TRẠNG THÁI
1		Vận hành cần cẩu cơ bản K57	1	29-12-2025	HOẠT ĐỘNG
2		Chương trình Đào tạo Vận hành Cẩu trực	1	26-12-2025	HOẠT ĐỘNG
3		Kỹ thuật vận hành cầu tự hành-V1	1	26-12-2025	HOẠT ĐỘNG
4		Kỹ thuật Vận hành Xe cầu Tự hành (UNIC UR-V Series)	7	22-12-2025	HOẠT ĐỘNG
5		Chương trình Đào tạo Vận hành Cẩu trực 2025	1	16-12-2025	HOẠT ĐỘNG

2. Create Training Program



## TAO CHƯƠNG TRÌNH

Điền thông tin chi tiết chương trình



### THÔNG TIN CƠ BẢN

\* TÊN CHƯƠNG TRÌNH

Nhập tên chương trình

0 / 120



### HÌNH ẢNH CHƯƠNG TRÌNH

\* URL HÌNH ẢNH

<https://www-assets.liebherr.com/media/l>

XEM TRƯỚC HÌNH ẢNH



URL ẢNH NỀN

<https://templates.framework-y.com/light>

XEM TRƯỚC ẢNH NỀN



### MÔ TẢ

Nhập mô tả chương trình

0 / 1000

Hủy

+ Tạo chương trình

3. Edit Training Program details

[← Quay lại](#) [HOẠT ĐỘNG](#)

## VẬN HÀNH CẦN CẨU CƠ BẢN K57

[x Hủy](#) [Lưu](#)

**THÔNG TIN CƠ BẢN**

\* TÊN CHƯƠNG TRÌNH  
 27 / 120

**HÌNH ẢNH CHƯƠNG TRÌNH**

\* URL HÌNH ÁNH  
 [XEM TRƯỚC HÌNH ÁNH](#)



\* URL ẢNH NỀN  
 [XEM TRƯỚC ẢNH NỀN](#)



**MÔ TẢ**

Vận hành cần cẩu cơ bản K57

27 / 1000

#### 4. Delete Training Program

[← Quay lại](#) [HOẠT ĐỘNG](#)

## VẬN HÀNH CẦN CẨU CƠ BẢN K57

Xóa chương trình  
 Bạn có chắc chắn muốn xóa chương trình này?

Sửa  Xóa [Cancel](#) [OK](#)



NGÀY TẠO 29-12-2025

TỔNG KHÓA HỌC 1

NGÀY TẠO 29-12-2025

NGÀY CẬP NHẬT 29-12-2025

MÔ TẢ

Vận hành cần cẩu cơ bản K57

**KHÓA HỌC** 1



+ Gán khóa học

#### 5. View All Courses

The screenshot displays a web-based application for managing courses. On the left, a sidebar menu titled 'QUẢN TRỊ VIÊN' (Administrator) includes options like 'TỔNG QUAN', 'NGƯỜI DÙNG', 'CHƯƠNG TRÌNH', 'KHÓA HỌC' (highlighted in yellow), 'LỚP HỌC', 'TÀI LIỆU', 'BÀI KIỂM TRA', and 'CHỨNG NHÂN'. The main content area is titled 'QUẢN LÝ KHÓA HỌC' (Course Management) and shows a list of courses with columns for 'HÌNH ẢNH', 'TÊN KHÓA HỌC', 'DANH MỤC', 'CẤP ĐỘ', and 'TRẠNG THÁI'. Each course entry includes a thumbnail, the course name, its category, level, and status ('HOẠT ĐỘNG'). A search bar at the top right allows users to search for specific courses.

HÌNH ẢNH	TÊN KHÓA HỌC	DANH MỤC	CẤP ĐỘ	TRẠNG THÁI
	Vận hành và điều khiển cần cẩu cơ bản K57 COURSE-57	Kỹ Thuật Điều Khiển	Trung cấp	HOẠT ĐỘNG
	Ứng phó sự cố và Kết thúc công việc- V2 COURSE-578	Cần Trục Tự Hành	Sơ cấp III	HOẠT ĐỘNG
	Ứng phó sự cố và Kết thúc công việc- V1 COURSE-577	Cần Trục Tự Hành	Sơ cấp III	HOẠT ĐỘNG
	Kỹ thuật vận hành cầu tự hành xe tải COURSE-576	Cần Trục Tự Hành	Chuyên viên	HOẠT ĐỘNG
	Kỹ thuật Vận hành (Operation) COURSE-188	Cần Trục Tự Hành	Sơ cấp III	HOẠT ĐỘNG
	Kiểm tra và Bảo dưỡng thiết bị COURSE-189	Cần Trục Tự Hành	Sơ cấp	HOẠT ĐỘNG

1-10 / 11 khóa học | < | 1 | 2 | > | 10 / page |

## 6. Create Course

## TAO KHÓA HỌC

Điền thông tin chi tiết khóa học

X

### THÔNG TIN CƠ BẢN

\* TÊN KHÓA HỌC

Nhập tên khóa học 0 / 200

\* MÃ KHÓA HỌC

Nhập mã khóa học 0 / 50

### PHÂN LOẠI

\* DANH MỤC

Chọn danh mục

\* CẤP ĐỘ

Chọn cấp độ

\* THỜI LƯỢNG (GIỜ)

ví dụ: 40

### HÌNH ẢNH KHÓA HỌC

\* URL HÌNH ẢNH

https://encrypted-tbn0.gstatic.com/images/

XEM TRƯỚC



URL ẢNH NỀN

https://templates.framework-y.com/lightv

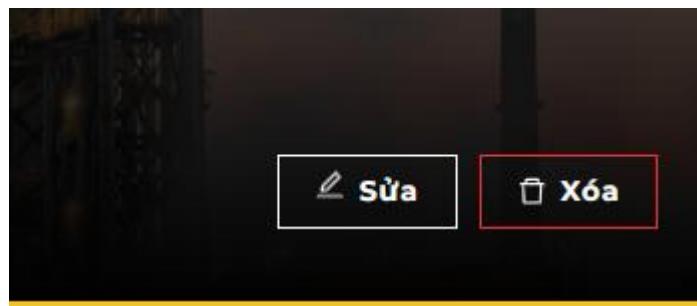
XEM TRƯỚC ẢNH NỀN



### MÔ TẢ

Nhập mô tả khóa học

## 7. Edit Course details



Screenshot of a course editing interface:

**TITLE:** SỬA KHÓA HỌC  
vận hành và điều khiển cần cẩu cơ bản K57

**FIELDS:**

- TÊN KHÓA HỌC:** Vận hành và điều khiển cần cẩu cơ bản K57 (41 / 200)
- MÃ KHÓA HỌC:** CK57 (4 / 50)
- DANH MỤC:** Kỹ Thuật Điều Khiển
- CẤP ĐỘ:** Trung cấp
- THỜI LƯỢNG (GIỜ):** 50
- URL HÌNH ẢNH:** https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQ...
- URL ẢNH NỀN:** https://templates.framework-y.com/lightwire/images/...
- TRẠNG THÁI:** Hoạt động (radio button selected)
- MÔ TẢ:** Vận hành và điều khiển cần cẩu cơ bản K57 (41 / 1000)

**Buttons:**

- Hủy
- Cập nhật khóa học

**Bottom navigation:**

- N
- HOẠT ĐỘNG
- 57
- THỜI LƯỢNG 50h
- HÀNH ĐỘNG
- HẬP TỪ EXCEL
- + Thêm chương
- THỜI LƯỢNG
- HÀNH ĐỘNG
- với dòng... 35 phút
- và sơ đồ t... 45 phút
- Thực hiện mô phỏng qua ứng dụng của hệ thống để hiểu rõ... 100 phút

## 8. Delete Course



## 9. Assign Course to Programs

NGÀY TẠO 29-12-2025

**GÁN KHÓA HỌC**

Vận hành cẩu cẩu cơ bản K57

<input type="checkbox"/> TÊN KHÓA HỌC	MÔ TẢ	TRẠNG THÁI
<input type="checkbox"/> <a href="#">Ứng phó sự cố và Kết thúc công việc- V2</a>	Ứng phó sự cố và Kết thúc công việc- ...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Ứng phó sự cố và Kết thúc công việc- V1</a>	Ứng phó sự cố và Kết thúc công việc- ...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Kỹ thuật vận hành cẩu tự hành xe tải</a>	Chinh phục kỹ năng vận hành cốt lõi: ...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Kỹ thuật Vận hành</a>	Trọng tâm của chương trình, kết hợp ...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Ứng phó sự cố và Kết thúc công việc</a>	Đánh giá: Quy trình xử lý tình huống k...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Kỹ thuật Vận hành (Operation)</a>	Học phần thực hành chuyên sâu: Tập t...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Kiểm tra và Bảo dưỡng thiết bị</a>	Đánh giá: Thiên về nhận biết dấu hiệu ...	<a href="#">HOẠT ĐỘNG</a>
<input type="checkbox"/> <a href="#">Lên kế hoạch và An toàn lao động</a>	Đánh giá: Học phần quan trọng, chia...	<a href="#">HOẠT ĐỘNG</a>

Total 11 courses 1 2 >

+ Gán đã chọn (0)
X Hủy

## 10. Add new section



## ADD NEW SECTION

Remaining time: 1800 minutes (Course: 1800 min, Used: 0 min)

\* SECTION TITLE

Enter section title

DESCRIPTION

Enter section description

DURATION (MINUTES)

60

Cancel

Create

11. Import Sections and Activity from Excel

## IMPORT SECTIONS FROM EXCEL



ID: 64

**(i) DOWNLOAD THE TEMPLATE, FILL EACH ROW, THEN UPLOAD THE FILE.**

- Template row example
- Column A: Section Name
- Column B: Order
- Column C: Duration (hours)



CHANGE EXCEL FILE

section\_activity (6).xlsx



section\_activity (6).xlsx

Cancel

Import

12. Add New Activity



## ADD NEW ACTIVITY

\* Activity Title

e.g., Introduction Video

\* Type

Material

\* Duration (Mins)

10

Description

Cancel

Save Activity

12. Assign the Materialto activity.

## EDIT ACTIVITY

ID: 146

\* Activity Title

Danh mục kiểm tra (Inspection Checklist)

\* Type

\* Duration (Mins)

Material

10

Assign Material

TCVN 10837:2015 (Document)

Furukawa UNIC UR-V Series Specifications. (Document)

Giới thiệu cầu tự hành UNIC UR-V340 (Video)

Video Cấu tạo & Vận hành (Video)

QCVN 29:2016/BLĐTBXH (Document)

**TCVN 10837:2015 (Document)**

AN TOÀN TRONG QUẢN LÝ VÀ VẬN HÀNH XE CẦU (Video)

Hướng dẫn vận hành cầu UNIC (Video)

Hướng dẫn đọc biểu đồ tải và tính toán an toàn (Document)

13. Assign the Practice activity.

n kỹ thuật huấn luyện (Planning Guide)

hồi h

dướ

y Inspect

TLE

kiểm

n bả

c hiệ

TLE

hộ ph

ng Hàng

hàng hóa

àng Qua Chương Ngoại vật

14. Assign the quiz to activity.

## EDIT ACTIVITY

ID: 149

\* Activity Title

Điều hướng Hàng hóa Zigzag

\* Type

Practice

\* Duration (Mins)

40

Assign Practice

Điều hướng Hàng hóa Zigzag

- Outrigger Deployment Drill
- Load Radius Practical
- Crane Operation
- Standard Signals Roleplay
- Emergency Response Simulation
- Kiểm tra bộ phận
- Điều hướng Hàng hóa Zigzag
- Di chuyển hàng hóa

 **EDIT ACTIVITY**  
ID: 143

\* Activity Title  
Biểu đồ tải trọng Quiz

\* Type: Quiz      \* Duration (Mins): 30

Assign Quiz

Kiểm tra Lý thuyết Vận hành Cẩu (10 pts) 

Hướng dẫn vận hành cẩu UNIC T1 (10 pts)  
Hướng dẫn vận hành cẩu UNIC T1 (10 pts)  
Hướng dẫn vận hành cẩu UNIC T1 (10 pts)  
Hướng dẫn vận hành cẩu UNIC T1 (10 pts)  
Kiểm tra biểu đồ tải trọng- V1 (10 pts)  
**Kiểm tra Lý thuyết Vận hành Cẩu (10 pts)**  
Final Exam kỹ thuật vận hành cẩu tự hành xe tải (10 pts)  
Bài kiểm tra checklist an toàn trước khi vận hành (10 pts)

15. Add Quiz to Theory Exam( Final Exam)

### CẤU HÌNH BÀI THI LÝ THUYẾT

\* Bài kiểm tra

\* Thời lượng (phút)

 \* Trọng số (%)  
30

\* Thời gian Bắt đầu

Select date

Thời gian Kết thúc

Select date

### CẤU HÌNH BÀI THI LÝ THUYẾT

\* Bài kiểm tra

- Hướng dẫn vận hành cầu UNIC T1 (20m)
- Hướng dẫn vận hành cầu UNIC T1 (20m)
- Hướng dẫn vận hành cầu UNIC T1 (20m)
- Hướng dẫn vận hành cầu UNIC T1 (20m)
- Kiểm tra biểu đồ tải trọng- V1 (20m)
- Kiểm tra Lý thuyết Vận hành Cầu (20m)
- Final Exam kỹ thuật vận hành cầu tự hành xe tải (30m)
- Bài kiểm tra checklist an toàn trước khi vận hành (20m)

**CẤU HÌNH BÀI THI LÝ THUYẾT**

\* Bài kiểm tra

Hướng dẫn vận hành cầu UNIC T1 (20m)

\* Thời lượng (phút) \* Trọng số (%)

20 30

Tối thiểu yêu cầu: 20 phút

\* Thời gian Bắt đầu Thời gian Kết thúc

Select date Select date

<< < > >>

Su	Mo	Tu	We	Th	Fr	Sa	00	00
28	29	30	31	1	2	3	01	01
4	5	6	7	8	9	10	02	02
11	12	13	14	15	16	17	03	03
18	19	20	21	22	23	24	04	04
25	26	27	28	29	30	31	05	05
1	2	3	4	5	6	7	06	06
							07	07
							08	08

Lưu

Now OK

16. Add Practice to Simulation Exam( Final Exam)

### CẤU HÌNH BÀI THI MÔ PHỎNG

\* Thực hành

\* Thời lượng (phút) \* Trọng số (%)

 20

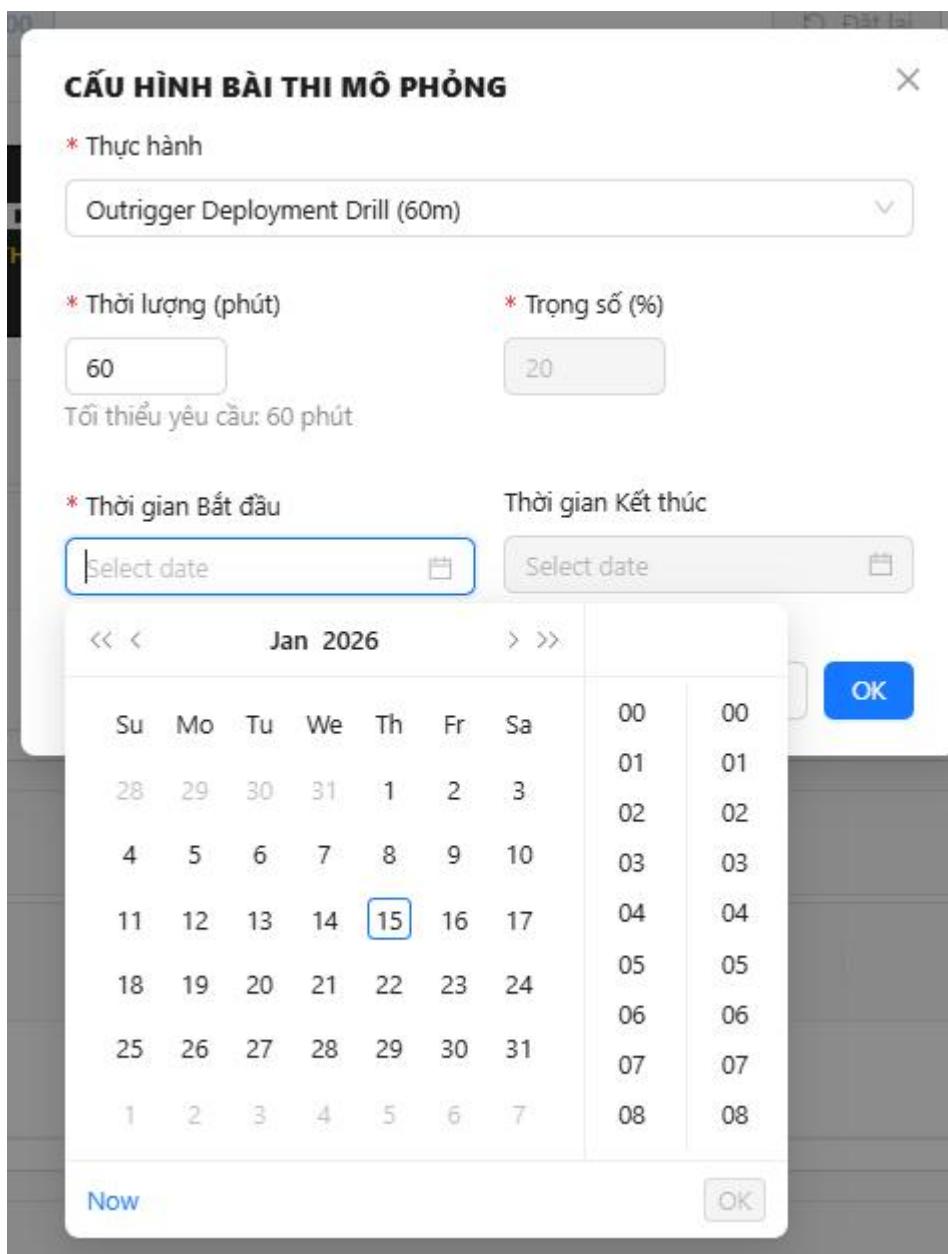
\* Thời gian Bắt đầu Thời gian Kết thúc

### CẤU HÌNH BÀI THI MÔ PHỎNG

\* Thực hành

- Outrigger Deployment Drill (60m)
- Load Radius Practical (60m)
- Crane Operation (150m)
- Standard Signals Roleplay (45m)
- Emergency Response Simulation (60m)
- Kiểm tra bộ phận (10m)
- Điều hướng Hàng hóa Zigzag (15m)
- Di chuyển hàng hóa (8m)



17. Add Practical to Practical Exam( Final Exam)

**CẤU HÌNH BÀI THI THỰC HÀNH**

* Thời lượng (phút)	* Trọng số (%)
90	50
* Thời gian Bắt đầu	Thời gian Kết thúc
Select date	Select date

**DANH SÁCH TIÊU CHÍ**

+ Thêm Tiêu chí

**Cancel** **OK**

**CẤU HÌNH BÀI THI THỰC HÀNH**

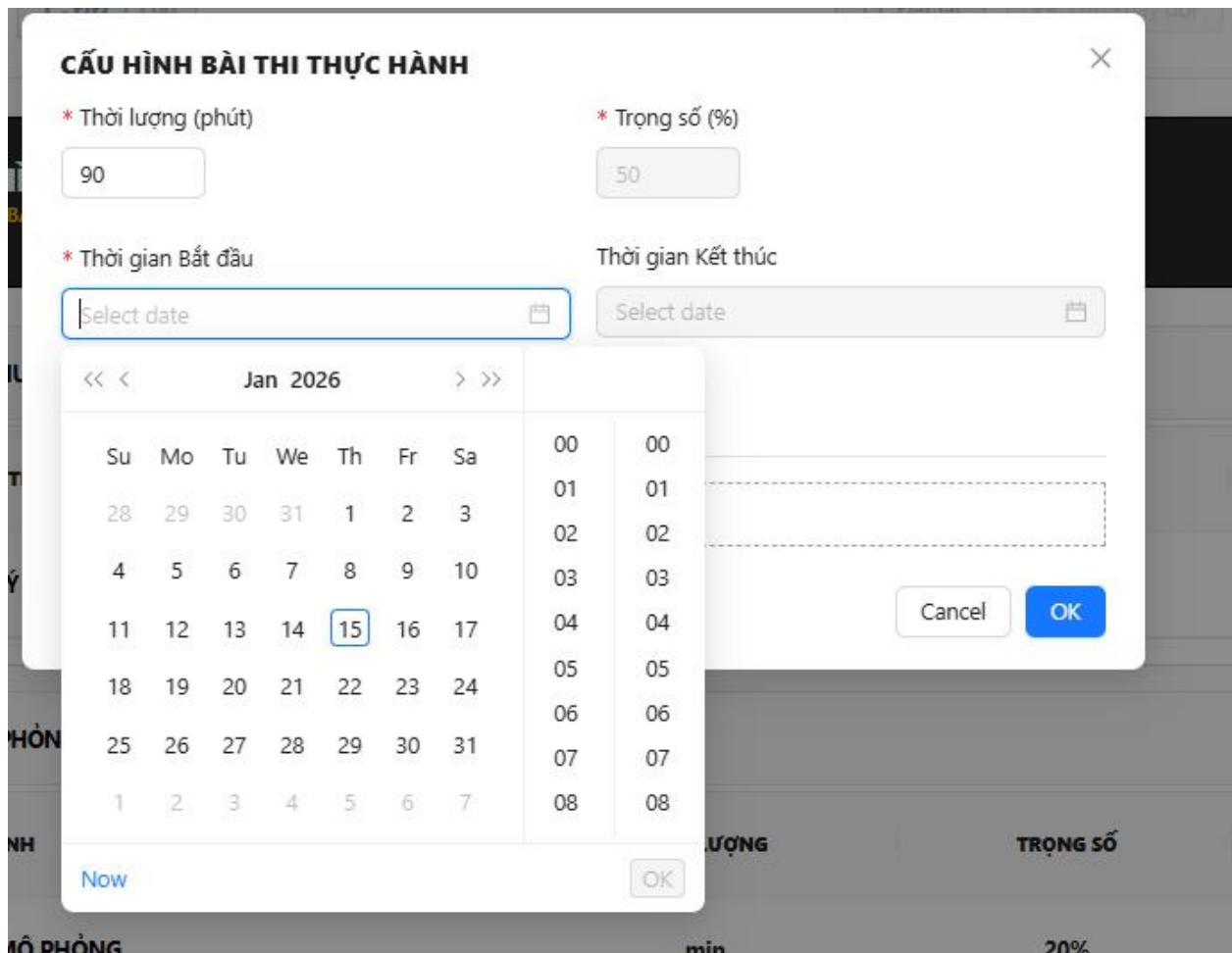
* Thời lượng (phút)	* Trọng số (%)
90	50
* Thời gian Bắt đầu	Thời gian Kết thúc
15-01-2026 00:00	15-01-2026 01:30

**DANH SÁCH TIÊU CHÍ**

kỹ thuật	mở được cẩu	<input type="button" value="⊖"/>
Kiến thức vận hành	Điều khiển được cẩu tốt	<input type="button" value="⊖"/>
Tên Tiêu chí	Mô tả	<input type="button" value="⊖"/>

+ Thêm Tiêu chí

**Cancel** **OK**



### 3.3.4 Feature 3: Class Management

Purpose: Create and edit learning classes (organize trainees into classes, assign instructors, and manage schedules)

Available Functions:

1. View All Classes
  - a. Navigate to Class management / Quản lý lớp học (Admin portal)
  - b. A table of all classes shall be displayed in the page

#	TÊN LỚP HỌC	MÃ LỚP HỌC	NGÀY BẮT ĐẦU	NGÀY KẾT THÚC	TRẠNG THÁI
1	Lớp điều khiển cần cầu cơ bản K57-001	LK57-001	30-12-2025	02-02-2026	DANG DIEN RA
2	Lop 1	Lop 1	27-12-2025	27-01-2026	CHUA MO
3	Khóa học vận hành cầu tự hành K25-V002	K25-V002	27-12-2025	27-01-2026	CHUA MO
4	Khóa học vận hành cầu tự hành K25-V001	K25-V001	26-12-2025	26-01-2026	DA HOAN THANH
5	C5 - Xử lý sự cố & Thu dọn thiết bị - K24.03	C5-SAFE-2403	26-12-2025	26-01-2026	DA HOAN THANH
6	C5 - Xử lý sự cố & Thu dọn thiết bị - K24.02	C5-SAFE-2402	26-12-2025	26-01-2026	DANG DIEN RA
7	Lớp Kỹ Thuật Xe Cẩu Chuyên Nghiệp	CCO-M25	26-12-2025	26-01-2026	DANG DIEN RA
8	C5 - Xử lý sự cố & Thu dọn thiết bị - K24.01	C5-SAFE-2401	24-12-2025	24-01-2026	DANG DIEN RA
9	Thực hành Vận hành Cầu & Xử lý Sự cố (K24-N1)	CLS-OP04-K24-01	23-12-2025	30-12-2025	MÔ
10	Tổng quan và Cơ sở pháp lý xe cầu tự hành	UNIC-K01	21-12-2025	30-12-2025	DANG DIEN RA

- c. There is a search bar at the top of the page (search by name and by code)
- d. There is a filter by class status next to search bar.

## 2. Create New Class

- a. Click Create / Thêm lớp học

- b. Fill the class information in the popup screen

 **TẠO LỚP HỌC**  
Điền thông tin chi tiết lớp học



 **THÔNG TIN CƠ BẢN**

\* TÊN LỚP HỌC

 Nhập tên lớp học 0 / 120

\* MÃ LỚP HỌC

 Nhập mã lớp học 0 / 50

 **CHƯƠNG TRÌNH & KHÓA HỌC**

\* CHƯƠNG TRÌNH

Chọn chương trình 

\* KHÓA HỌC

Chọn khóa học 

 **LỊCH TRÌNH**

\* NGÀY BẮT ĐẦU

15-01-2026 

\* NGÀY KẾT THÚC

15-02-2026 

\* SỨC CHỨA

10

 **MÔ TẢ**

Mô tả

0 / 500

X Hủy

+ Tạo lớp học

c. We shall select program and course from existed list.

<p>* CHƯƠNG TRÌNH</p> <input type="text" value="Chọn chương trình"/>	<p>* KHÓA HỌC</p> <input type="text" value="Chọn khóa học"/>
Chương trình Đào tạo Vận hành Cần cẩu 20...	
Kỹ thuật Vận hành Xe cầu Tự hành (UNIC U...	
Kỹ thuật vận hành cầu tự hành-V1	
Chương trình Đào tạo Vận hành Cần cẩu...	
Vận hành cần cẩu cơ bản K57	

\* NGÀY KẾT THÚC

15-02-2026

- d. No duplicated class code or class name
- e. Confirm the process by clicking Create / Tạo
- f. Any violation of the system rules shall cancel the process

### 3. Edit Class Details

- a. Click onto a target class in the table to view its details.

#	TÊN LỚP HỌC	MÃ LỚP HỌC	NGÀY BẮT ĐẦU	NGÀY KẾT THÚC	TRẠNG THÁI
1	Lớp điều khiển cần cẩu cơ bản K57-001	LK57-001	30-12-2025	02-02-2026	DANG DIỄN RA
2	Lop 1	Lop 1	27-12-2025	27-01-2026	CHUA MỞ

- b. In the class detail page, click Edit / Sửa



- c. Change the editable information (with blocked information printed gray)

 CHỈNH SỬA LỚP

 THÔNG TIN CƠ BẢN

\* TÊN LỚP HỌC  
Khóa học vận hành cầu tự hành K25-V001 38 / 120

MÃ LỚP HỌC  
K25-V001

 CHƯƠNG TRÌNH & KHÓA HỌC

\* CHƯƠNG TRÌNH  
Kỹ thuật vận hành cầu tự hành-V1

\* KHÓA HỌC  
Ứng phó sự cố và Kết thúc công việc- V2 (Sơ cấp III)

 LỊCH TRÌNH & SỨC CHỨA

\* NGÀY BẮT ĐẦU  
26-12-2025

\* NGÀY KẾT THÚC  
26-01-2026

\* SỨC CHỨA  
10

 HÌNH ẢNH

d. Confirm the change by clicking Save / Cập nhật

33 / 500

X Hủy  Cập nhật lớp học

#### 4. Manage Class Enrollments

**Thêm học viên vào lớp**

Search by name or email...					
<input type="checkbox"/>	Avatar	Họ và tên	Email	Điện thoại	Trạng thái
<input type="checkbox"/>		Nguyễn Văn An	annguyensiunhan@gmail.com	0901234567	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Phạm Thị Hương	huongphammientay@gmail.com	0987654321	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Phạm Tiến Dũng	dungphambentre@gmail.com	0905550101	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Trần Việt Hoàng	hoangtranfanj97@gmail.com	0905550303	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Trần Thanh Tân	hocketv@gmail.com	0901234567	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Đặng Thành Trung	cungquanghoctap@gmail.com	0902345678	<b>HOẠT ĐỘNG</b>
<input type="checkbox"/>		Lưu Trọng Nghĩa	gemininhavin@gmail.com	0901234567	<b>HOẠT ĐỘNG</b>

TOTAL 23 TRAINEES < 1 2 3 >

Select trainees to enroll Hủy + Đăng ký đã chọn (0)

## 5. Manage Class Instructor

**GIẢNG VIÊN**

Chọn giảng viên

**NGUYỄN ĐẠT**  
INS6WFFWR

Chưa có giảng viên được gán

## 6. Manage Class Timeslots (Schedule)

## THÊM BUỔI MỚI

X

\* TÊN BUỔI

ví dụ: Buổi 1: Giới thiệu

\* THỜI GIAN BẮT ĐẦU

Chọn thời gian bắt đầu

\* THỜI GIAN KẾT THÚC

Chọn thời gian kết thúc

\* TÒA NHÀ

Trung Tâm Dạy Xe Cầu Quận 9

\* PHÒNG

P.218

\* CHI TIẾT ĐỊA ĐIỂM

487A Đ. Lê Văn Việt, Tăng Nhơn Phú A, Quận 9, Thành phố Hồ Chí Minh, Vietnam

Cancel

OK

7. Manage Class Final Exam

TÊN BÀI KIỂM TRA	THỜI LƯỢNG	TRỌNG SỐ	THỜI GIAN	HÀNH ĐỘNG
KIỂM TRA BIỂU ĐỒ TẢI TRONG- V1	25 min	30%	27-12-2025 08:00:00	<a href="#">Sửa</a>
DI CHUYỂN HÀNG HÓA	15 min	20%	30-12-2025 08:00:00	<a href="#">Sửa</a>
NỘI DUNG BÀI THI	THỜI LƯỢNG	TRỌNG SỐ	THỜI GIAN	HÀNH ĐỘNG
DANH SÁCH KIỂM TRA THỰC HÀNH (2 MỤC)	45 min	50%	31-12-2025 08:00:00	<a href="#">Sửa</a>

## 8. View issued certificates (for class completion)

[Tổng quan](#)
[Thi cuối khóa](#)
[Chứng chỉ](#)

**KHÓA HỌC GỐC**

**TỔNG QUAN VÀ CƠ SỞ PHÁP LÝ**

**NO CODE**

**DANH MỤC**: Căn Trục Tự Hành | **THỜI LƯỢNG**: 40 giờ | **CẤP ĐỘ**: Sơ cấp | **PHIẾU BẢN**: v1.0

Khóa học giới thiệu tổng quan về xe cầu tự hành (đặc biệt dòng UNIC UR-V Series), giải thích các thuật ngữ kỹ thuật quan trọng như tải trọng định mức, bán kính làm việc. Đồng thời, trang bị kiến thức về cơ sở pháp lý, yêu cầu chứng chỉ và kiểm định an toàn theo quy ... [more](#)

**CHỨNG CHỈ LỚP HỌC**

**MẪU CHỨNG CHỈ**

**Chứng Nhận Hoàn Thành**

**KHOA HỌC NGUỒN**

**Khóa học Hiện tại**

Đây là chứng nhận được quy chuẩn bởi Trung Tâm Đào Tạo Lái Xe Cầu Chuyên Dụng LSSCTC. Là chứng nhận học viên đã hoàn thành khóa học theo đúng điều kiện do trung tâm yêu cầu và kiểm duyệt. Đây chỉ bằn chứng nhận điện tử và cần dấu mộc của LSSCTC để có hiệu lực pháp lý.

**CHỨNG CHỈ ĐÃ CẤP**

HỌC VIÊN	NGÀY CẤP	MÃ CHỨNG CHỈ
Chưa có chứng chỉ nào được cấp.		

### 3.3.5 Feature 4: Learning Content Management

Purpose: Create assessments to evaluate trainee knowledge and understanding

Available Functions:

1. Create Quiz (Tạo bài kiểm tra)
2. Import Quiz (Nhập file bài kiểm tra)
  - a. Click Import / Nhập Bài kiểm tra button on the task bar

- b. The import file should follow system provided format (you can download the template to see detail)

	Question Name	Score	Is Multiple	Description	Option Name	Is Correct	Explanation
1	What must the operator check before operating the crane?	2.5	FALSE	Safety Check	Check engine oil, coolant, tires, and brake system.	TRUE	Mandatory safety procedure.
2	What must the operator check before operating the crane?	2.5	FALSE	Safety Check	Just check if the key is present.	FALSE	Incorrect and dangerous.
3	When deploying outriggers, which requirement is correct?	2.5	FALSE	Crane Technique	Fully extend outriggers and use pads on soft ground.	TRUE	Ensures maximum stability.
4	When deploying outriggers, which requirement is correct?	2.5	FALSE	Crane Technique	Extend outriggers halfway to save space.	FALSE	Risk of tipping over.
5	Hand signal: Arm extended, palm down, moving hand horizontally means?	2.5	FALSE	Hand Signals	Emergency Stop.	TRUE	Standard ISO signal.
6	Hand signal: Arm extended, palm down, moving hand horizontally means?	2.5	FALSE	Hand Signals	Raise the boom.	FALSE	Incorrect signal.
7	Which action is STRICTLY PROHIBITED when operating a crane?	2.5	FALSE	Safety Rules	Using the crane hook/bucket to lift people.	TRUE	Strictly forbidden by safety regulations.
8	Which action is STRICTLY PROHIBITED when operating a crane?	2.5	FALSE	Safety Rules	Operating at night with proper lighting.	FALSE	Allowed if visibility is good.
9							
10							
11							
12							
13							
14							
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16							
17							
18							
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26							
27							
28							
29							
30							
31							

### 3. Edit Quiz (Sửa Bài kiểm tra)

- a. Click Edit / Sửa on a specific quiz in the table
- b. Change the quiz content which includes questions and answers
- c. Confirm the change by clicking Save / Lưu

**SỬA BÀI KIỂM TRA**

**THÔNG TIN BÀI KIỂM TRA**

\* TÊN BÀI KIỂM TRA: Hướng dẫn vận hành cầu UNIC T1

TỔNG ĐIỂM: 10.00

\* ĐIỂM ĐẦU (ĐIỂM): 5

\* THỜI GIAN (PHÚT): 20

\* SỐ LẦN LÂM TỐI ĐA: 1

MÔ TẢ: Mô tả tùy chọn

CÂU HỎI:

- d. Any violation of the system rules will make this progress cancelled.

**! ! TỔNG ĐIỂM BÀI KIỂM TRA PHẢI BẰNG ĐÚNG 10 ĐIỂM ĐỂ TẠO BÀI KIỂM TRA**

#### 4. Delete Quiz (Xóa Bài kiểm tra)

- Click Delete / Xóa button on a specific quiz in the table
- Confirm deletion
- Any violation of the system rules shall block this progress

TÊN	THỜI GIAN	ĐIỂM ĐẠT	TỔNG ĐIỂM	HÀNH ĐỘNG
Hướng dẫn vận hành cầu UNIC T1	20 Phút	5 điểm	10	Xóa

#### 5. Create Learning Material (Tạo Tài liệu học tập)

- Navigate to Material Management / Quản lý tài liệu (Admin role)

**TÀI LIỆU**

+ Thêm tài liệu

TÊN	LOẠI	TRUY CẬP	HÀNH ĐỘNG
Furukawa UNIC UR-V Series Specifications. Đây là trang chủ của UNIC toàn cầu...	TÀI LIỆU	Truy cập	Xoá
Giới thiệu cầu tự hành UNIC UR-V340 Các kênh của đại lý xe tải như Hino, ...	VIDEO	Truy cập	Xoá
Video Cấu tạo & Vận hành	VIDEO	Truy cập	Xoá

- Click Create / Thêm Tài liệu on the task bar in the top of the page

**TÀI LIỆU**

+ Thêm tài liệu

Q. Tìm kiếm tài liệu...

- Fill details for the new learning material.

**+ TÀI LIỆU MỚI**

**TÊN TÀI LIỆU**  
VD: Hướng dẫn an toàn 2024

**MÔ TẢ** (optional)  
Mô tả ngắn về tài liệu...

**LOẠI NỘI DUNG** **NGUỒN**  
Tài liệu | Liên kết ngoài

**ĐỊA CHỈ URL**  
https://example.com/resource

Hủy **Tạo mới**

- d. For material source, there are two options, which are Link / File

**LOẠI NỘI DUNG** **NGUỒN**

Tài liệu | Tải file lên

**TỆP TIN**  
NHẤN ĐỂ TẢI LÊN

**LOẠI NỘI DUNG** **NGUỒN**

Tài liệu | Liên kết ngoài

**ĐỊA CHỈ URL**  
https://example.com/resource

- e. Confirm the creating by clicking Save / Tạo mới  
f. Any violation of the system rules shall cancel this process.

## 6. Edit Learning Material (Sửa Tài liệu học tập)

- a. Click Edit icon on a specific learning material in the table.

TÊN	LOẠI	TRUY CẬP	HÀNH ĐỘNG
Furukawa UNIC UR-V Series Specifications. Đây là trang chủ của UNIC toàn cầu...	TÀI LIỆU	Truy cập	Sửa

- b. A editable screen shall display after the previous step. You can now change the material details such as name, description, type and source.

- c. There are two available types: Video and PDF (Đoạn ghi hình và tài liệu đọc)

- d. There are two available sources: Link and File (Đường dẫn và tài liệu gốc)  
e. Confirm the process by clicking Save / Cập nhật  
f. Any violation of the system rules shall cancel the process.

## 7. Delete Learning Material (Xóa Tài liệu học tập)

- a. Click Delete icon on a specific learning material in the table.

TÊN	LOẠI	TRUY CẬP	HÀNH ĐỘNG
Furukawa UNIC UR-V Series Specifications. Đây là trang chủ của UNIC toàn cầu...	TÀI LIỆU	Truy cập	Xóa

- b. Confirm the deletion by clicking Delete / Xóa or cancel the deletion by clicking Cancel / Hủy

The screenshot shows a web application interface for managing documents. On the left, there's a sidebar with navigation links like 'TỔNG QUAN', 'NGƯỜI DÙNG', 'CHƯƠNG TRÌNH', 'KHÓA HỌC', 'LỚP HỌC', 'TÀI LIỆU' (which is highlighted in yellow), 'BÀI KIỂM TRA', and 'CHỨNG NHẬN'. The main content area is titled 'TÀI LIỆU' and shows a list of documents. A modal dialog box is open in the center, asking 'Bạn có chắc chắn muốn xóa tài liệu này? Hành động này không thể hoàn tác.' (Are you sure you want to delete this document? This action cannot be undone.).

- c. Any violation of the system rules shall cancel the process

### 3.3.6 Feature 5: Simulation Practice

#### 1. Download file exe

- Navigate to Simulation page by selecting Simulation / Mô phỏng in the web task bar.

The screenshot shows the LSSCTC website's main navigation bar. The menu items include 'TRANG CHỦ', 'CHƯƠNG TRÌNH', 'MÔ PHỎNG' (which is highlighted in yellow), and 'GIỚI THIỆU'. There is also a user profile icon and a language switcher for 'Vie'.

- The simulation engine provided by the center shall be listed in the simulation page

The screenshot shows the '3D SIMULATION' page. The 'MÔ PHỎNG' tab is selected. A large text block discusses the simulation engine, mentioning it converts given values from game units to linear color space, supports textures, and includes a color calibration feature. Below the text are two buttons: 'Tải Mô phỏng' (Download Model) and 'MỞ LINK DỰ PHÒNG' (Open Preview Link).

- Read all the details about hardware requirements and implementation guide.

The screenshot shows two sections: 'PHIÊN BẢN MÔ PHỎNG MỚI NHẤT' (Latest Model Version) and 'THÔNG SỐ PHẦN CỨNG ĐỀ CỨ' (Hardware Requirements). The 'PHIÊN BẢN MÔ PHỎNG MỚI NHẤT' section lists 'V1.0.0', '450MB', and 'Windows 10/11 (64-bit)'. The 'THÔNG SỐ PHẦN CỨNG ĐỀ CỨ' section lists 'OS Windows 10/11 (64-bit)', 'PROCESSOR Intel i5 or AMD equivalent', 'STORAGE 2GB available space', and 'GPU DirectX 11 compatible'.

BƯỚC 1  
**CÀI ĐẶT ỨNG DỤNG**



- Downloading the File: Click the "Tải Mô phỏng" (Download Simulator) button to download the .exe installer.
- Connection Stability: Ensure you have a stable internet connection (at least 100 Mbps recommended) throughout the download process to avoid file corruption.



- Download Failure: If the download fails or the file does not open, delete the partial file and restart the download from the beginning.
- There is a contact information for troubleshooting or feedback about the engine at the bottom of the page.

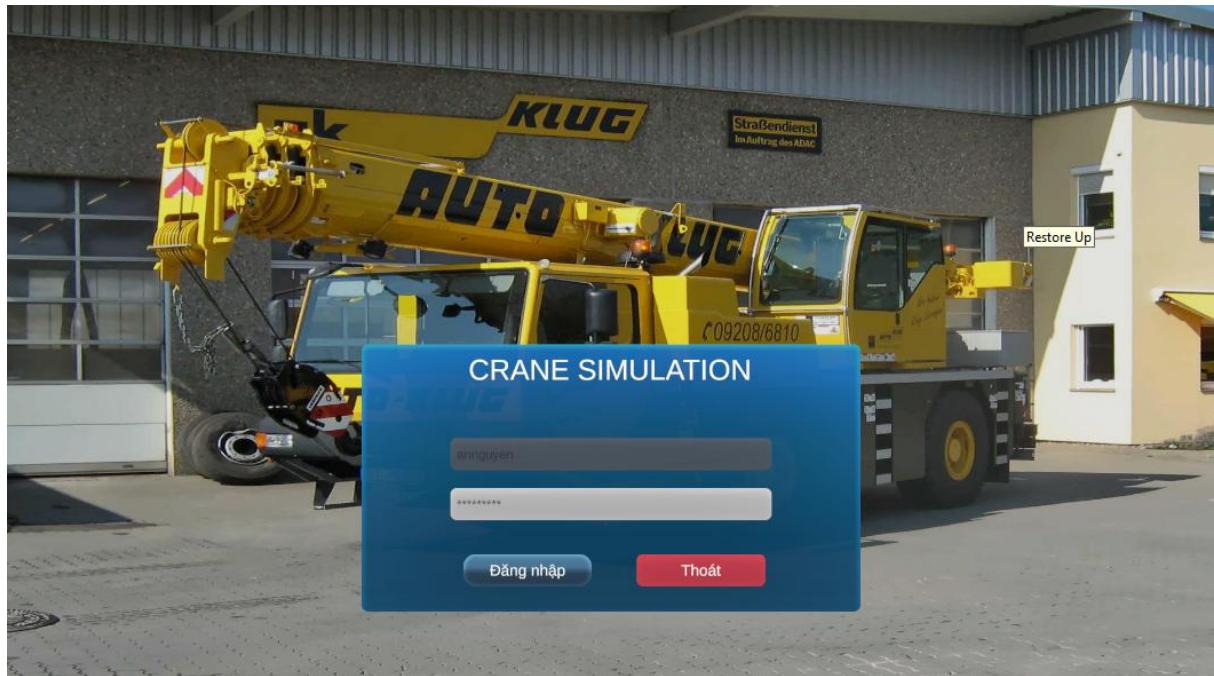
Gặp vấn đề cài đặt? Gửi email [NHATDMSE182236@FPT.EDU.VN](mailto:NHATDMSE182236@FPT.EDU.VN)

## 2. Open CraneSimulator.exe file

- Security Warnings: When launching the application, your operating system (Windows) may display a security alert such as "Windows protected your PC" or "Unknown Publisher." \* Action: Click "More info" and select "Run anyway" to bypass the warning.

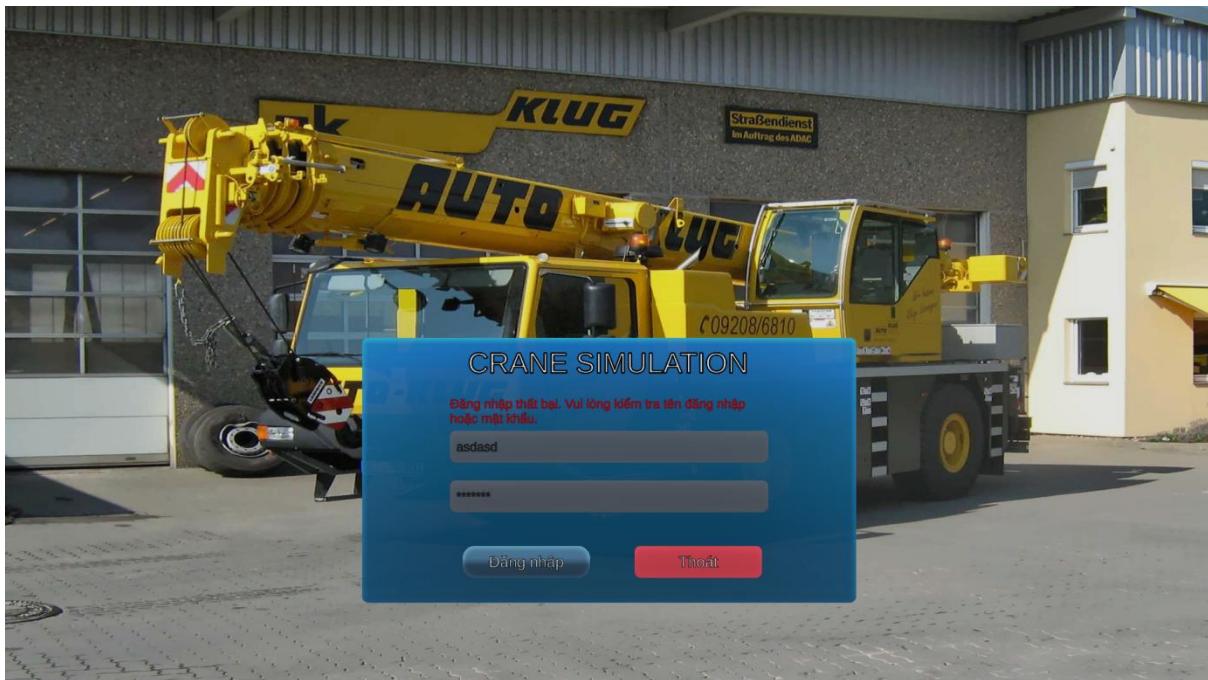
Name	Date modified	Type	Size
CraneSimulator_BurstDebugInformation...	12/19/2025 9:08 PM	File folder	
CraneSimulator_Data	12/19/2025 9:08 PM	File folder	
D3D12	12/19/2025 9:08 PM	File folder	
MonoBleedingEdge	12/19/2025 9:08 PM	File folder	
CraneSimulator.exe	12/18/2025 5:37 AM	Application	657 KB
UnityCrashHandler64.exe	12/18/2025 5:37 AM	Application	1,496 KB
UnityPlayer.dll	12/18/2025 5:37 AM	Application extens...	32,888 KB

### 3. Login with username and password of an active trainee account



Login problems:

- If the login fails, please try to login again in website to make sure the credentials are correct
- In case you do not remember your login information, use your assigned email to renew the credentials in student portal website.
- Contact center hotline number or email to gain better help.



#### 4. Select practice mode.

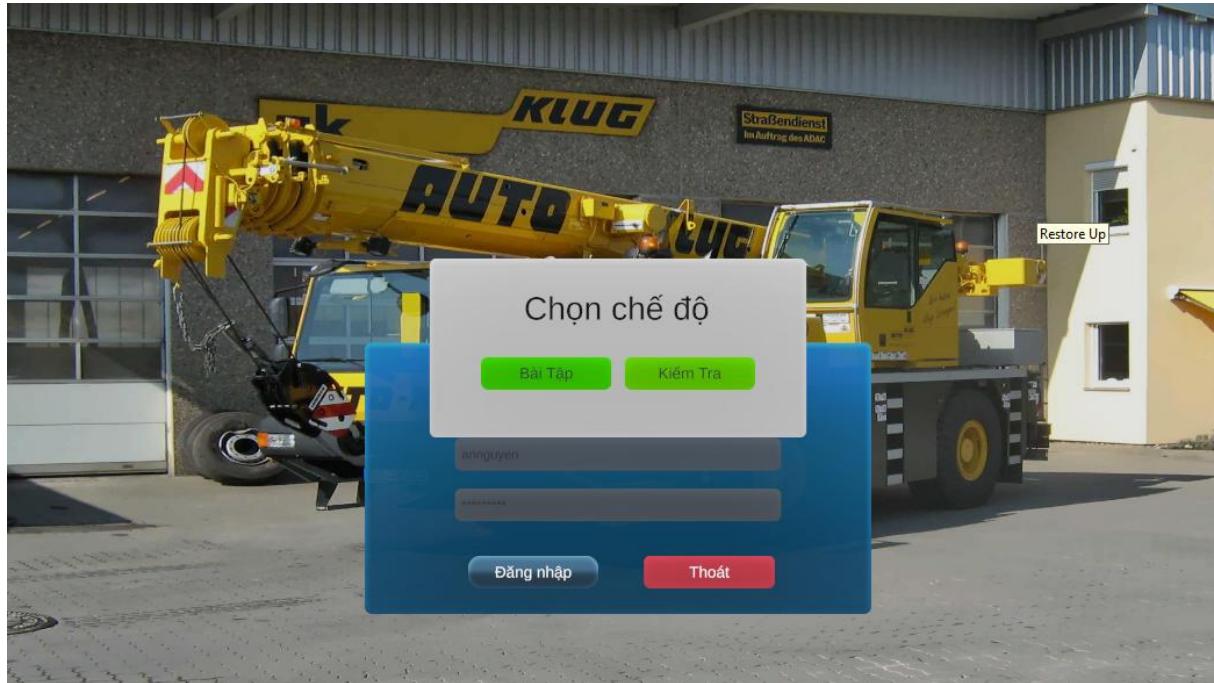
- Once logged into the LSSCTC Simulator, you will be presented with two distinct modes. The availability of these modes depends on your current enrollment status and the permissions granted by your Instructor.

##### 4.1. "Bài Tập" (Practice) Mode

- 
- **Purpose:** To allow trainees to familiarize themselves with the crane controls without the pressure of a final score.
- Accessibility: This mode is usually unlocked automatically once you are assigned to a class.
- Repetition: You can restart this mode as many times as needed to perfect your practice.

##### 4.1. "Kiểm Tra" (Exam) Mode

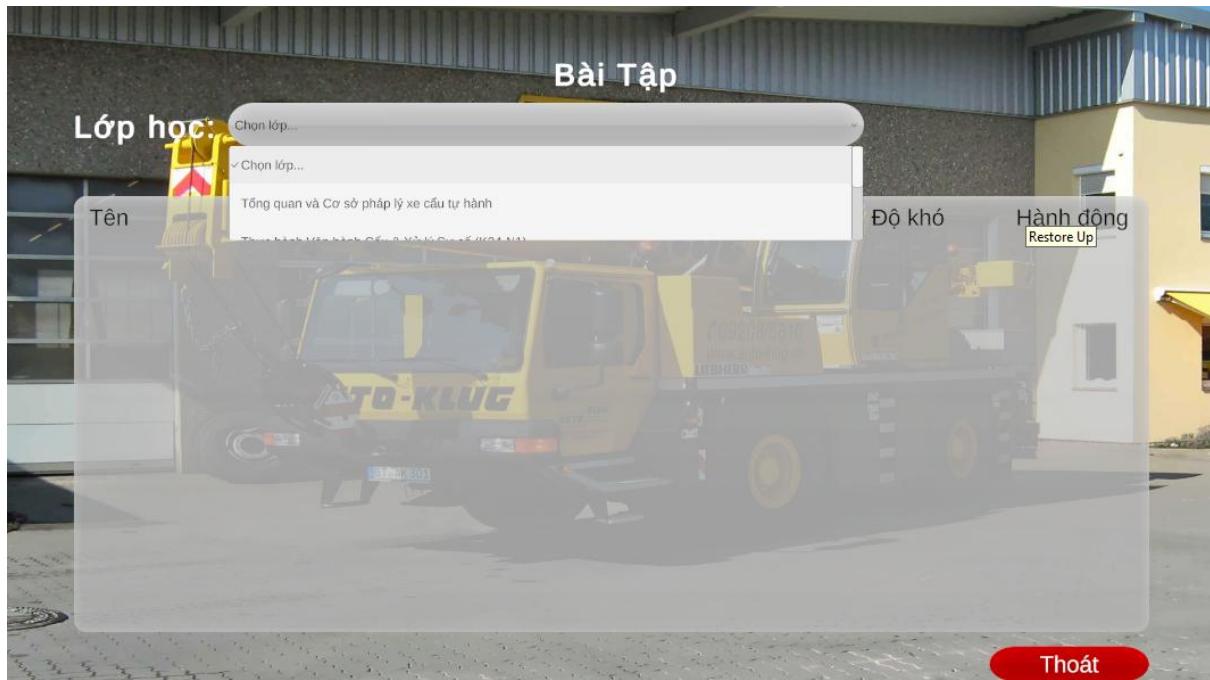
- Access Requirements:
  - Instructor Activation: This mode will only be visible if an Instructor or Admin has scheduled and activated an exam for your specific class.
  - Access Code (Security): To enter the exam, you must provide a unique Access Code. This code is provided only by your Instructor or the Program Manager at the beginning of the testing session.
- Limit Attempt: Unlike Practice Mode, Exam Mode may limit the number of attempts you can make, and your performance metrics (score and time) are sent directly to the Instructor's dashboard.
- Technical Safety: Ensure you have a stable connection before starting; if the application crashes or you lose internet, you must immediately contact your Instructor to reset your session.



##### 5. Select Class.

After choosing your desired mode (Practice or Exam), you must specify the training group you are participating in to ensure your progress is recorded correctly.

- **Class Selection Logic:** The system will display a dropdown list of Classes that you are currently enrolled in.
- **Enrollment Requirement:** A class will only appear in this list if your Enrollment has been officially Approved by the Admin or Instructor.
- **Course Coordination:** Each class is tied to a specific Training Program or Course; ensure you select the one corresponding to your current curriculum.



#### 6. Select practice to start.

After selecting the correct class, the system will display the list of available simulation scenarios assigned to that specific group. This step ensures you are entering the correct training environment for your current module.



#### 7. Read practice guide before doing the practice.

Once you select a scenario, a Practice Guide overlay will appear. This is a critical preparation phase—do not skip it, as it contains the specific rules for the simulation environment.

##### 7.1 Key Information to Review

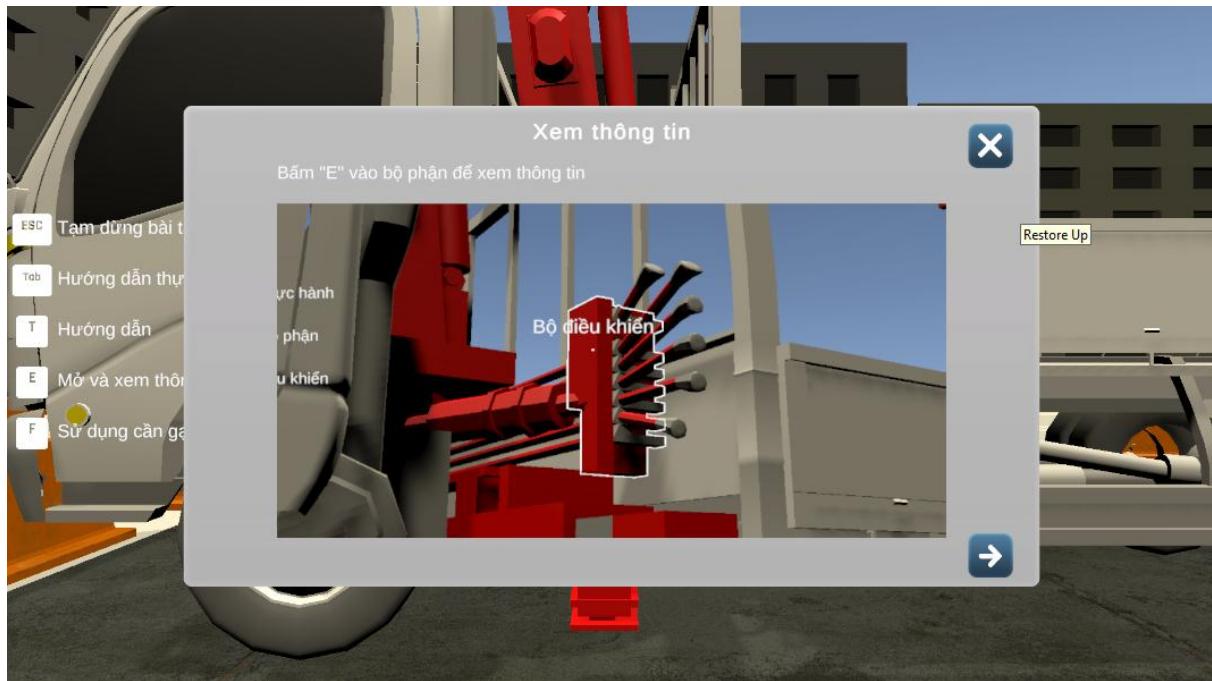
- Operational Objectives: Understand the exact start and end points of the cargo (e.g., from the ground to the truck bed).
- Safety Constraints: Review the "ZigZac" path requirements; the system will not count progress if you deviate from this specific path.
- Penalty Rules: Be aware that every time the cargo or hook touches a pole, your score will be automatically reduced by 0.5 points.

## 7.2 Understanding Phase Transitions

- Phase 1: Focuses on navigating the obstacle course (the ZigZac poles).
- Phase 2: Activates only after Phase 1 is completed successfully; the target text will change, signaling you to move the cargo to the final drop-off point (the truck).

## 7.3 Operational Tips

- Lever Identification: Use the guide to familiarize yourself with which levers control the boom, the winch, and the rotation before you engage them with the "F" key.
- Visual Cues: Look for "Target Point" in the 3D world which indicate where the cargo needs to be positioned next.



## 8. Important key when doing practice.

Operating the crane simulator requires precise coordination between keyboard inputs and visual cues. Familiarize yourself with these essential controls before engaging the crane components.



## 9. Lever Identification and Focus.

Before engaging the crane, you must identify which control component you wish to operate. The simulator uses a proximity-based "Focus" system to prevent accidental movements.

- First-Person Interaction: Use your mouse to look around the crane cabin or control station.
- Visual Hover: Move your crosshair (reticle) directly over a specific crane lever.
- Name Recognition: Wait for the Lever Name to appear on your screen (e.g., "Main Hoist," "Boom Luffing," or "Swing Control").
- Contextual Awareness: Different levers correspond to different 3D components of the crane; always verify the lever name matches your intended action before pressing the interaction key.



10. Press "F" to the lever to control the Crane with Corresponding components.

Once the name of the lever is visible, you are ready to begin the operation.

- Engage: Press the "F" key to lock your focus onto that specific lever
- Dynamic Controls: As soon as you engage a lever, the Hint Keys at the bottom right will update to show you the movement controls for that specific part of the crane (e.g., Forward/Backward or Left/Right).
- Switching Controls: To move to a different lever, press "F" again to release the current one, then repeat the hover process for the next control.



11. Hints.

- Control Labels: Use the hint key display on the bottom right of your screen as a constant reference for operating the crane's components.
- Real-time Guidance: These hint keys will change dynamically based on which lever you have selected, helping you move the crane accurately toward the target cargo.



## 12. Operating the Crane Using Dynamic Hints

The simulator provides real-time guidance to help you master the crane's complex movements. The hint system ensures you always know which keys correspond to your current lever selection.

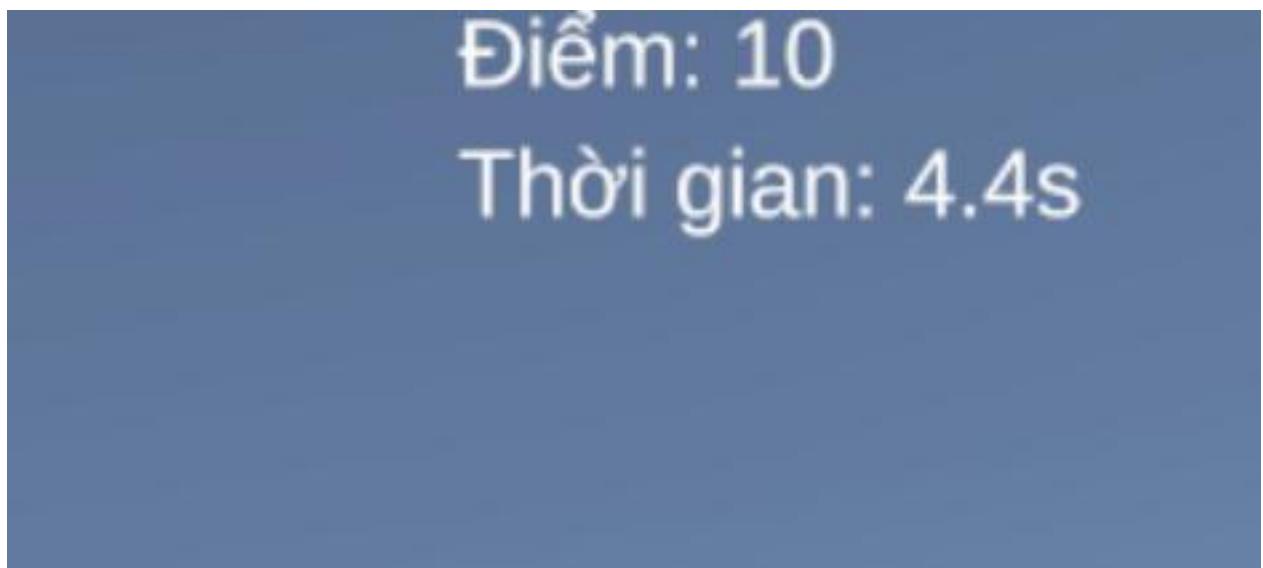
- Dynamic Mapping: Once you have engaged a lever with the "F" key, look at the bottom right corner of your screen.
- Contextual Control: The hint panel will update instantly to show you the specific keys (e.g., Arrow Keys or W/A/S/D) required to move the current component (Boom, Swing, or Hoist).
- Precision Movement:
  - Tap vs. Hold: For fine adjustments when approaching a target, tap the keys lightly.
  - Coordinated Control: While only one lever is controlled at a time, you must sequence your movements (lifting, then swinging, then luffing) to maintain a smooth path.



### 13. Monitoring Performance Metrics.

As you use the hint keys to move the crane, stay aware of your operational status:

- Score and Timer: These are visible at the top right of the screen.
- Penalty Awareness: Remember that jerky movements or over-swinging can lead to collisions with the ZigZac poles, resulting in a 0.5 point deduction per hit.



14. Move the crane to the target cargo.

- Identify Destination: Use the camera to locate the Target Cargo in the simulation area.
- Approach: Move the crane steadily until the hook block is centered over the load, preparing for the attachment phase.



15. Press "B" to attach the cargo to the hook block.

- Attachment Protocol: Lower the hook block until it is within the attachment radius of the cargo.
- Locking: Press "B" to secure the cargo to the hook.



16.Lift the cargo up and doing the practice.

Once the cargo is securely attached using the "B" key, you must perform a controlled lift to begin the maneuver.

- Vertical Control: Use the Hoist/Winch lever to lift the cargo vertically.
- Safety Clearance: Lift the cargo to a height that clears ground obstacles but remains low enough to maintain a low center of gravity.
- Swing Dampening: Wait for any initial pendulum swing to settle before starting horizontal movement to avoid immediate collisions with the first set of poles.
- Telemetry Monitoring: Check the top right of the screen to ensure the weight load is balanced and the timer has officially started for the practice session.



17. Move the Cargo to the target point.

The ZigZac practice is divided into two distinct phases. You must complete the objective of Phase 1 before the system will allow you to proceed to Phase 2.

#### 17.1. “Zigzag” practice target.

“Zigzag” practice phase 1 target.

- Primary Goal: You must navigate the suspended cargo through the pole course following the designated zigzag trajectory.
- Path Accuracy: The cargo must stay within the zigzag boundary; if you skip a section of the path, the maneuver will not be counted as valid.
- Landing Zone: Phase 1 concludes when you move the cargo to the first target point and lower it to the designated surface.
- Collision Monitoring: Throughout this phase, ensure the cargo does not touch the poles, as each contact results in a 0.5 point deduction from your score.



“Zigzag” practice phase 2 target.

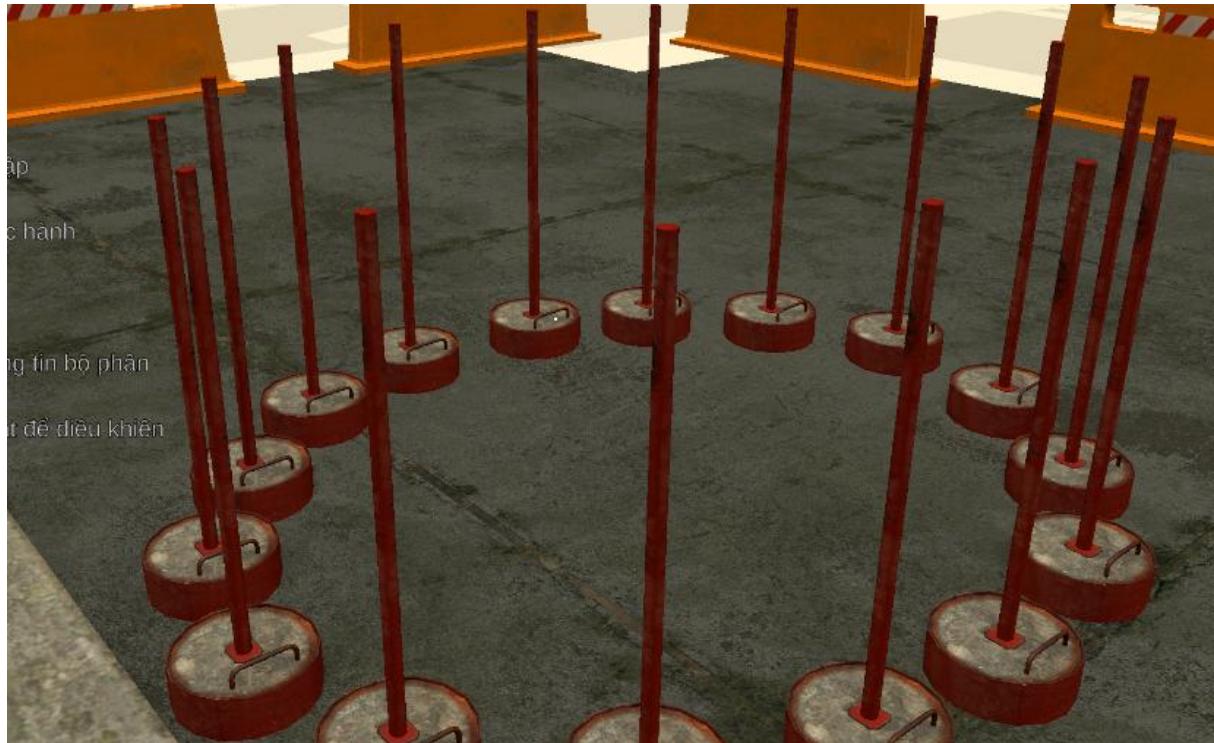
- Transition: Once Phase 1 is completed, the objective text on your screen will update, signaling the start of Phase 2.
- Primary Goal: Move the cargo from the Phase 1 landing zone to the back of the transport truck (Target 2).
- Precision Control: Carefully align the cargo over the truck bed using the hint keys to coordinate swing and boom movements.
- Completion: Lower the cargo onto the truck bed before opening the menu to submit your results.



17.2. Cargo positioning practice target.

This scenario focuses exclusively on your ability to perform precise vertical and horizontal adjustments to center a load.

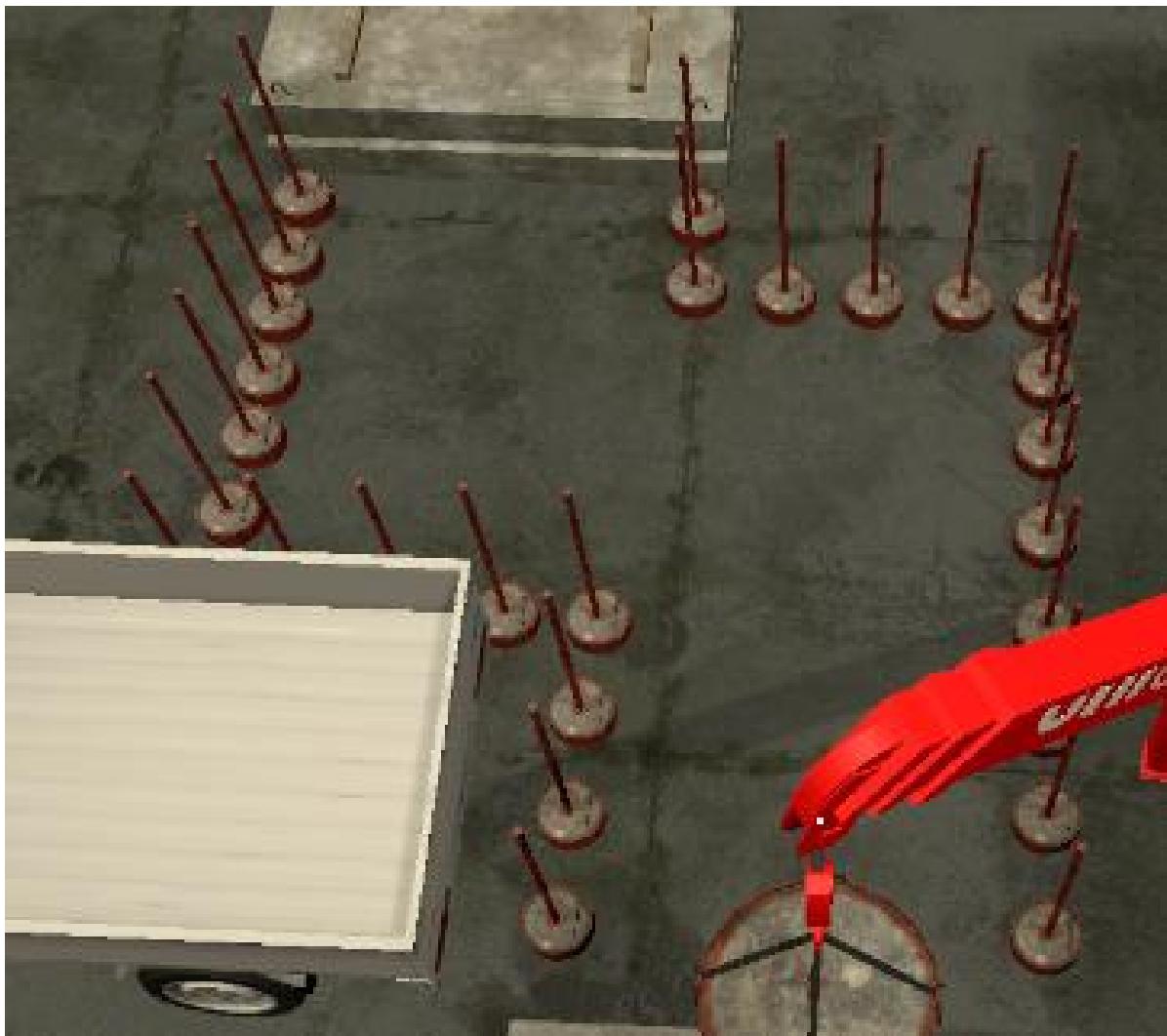
- Primary Goal: Move the cargo from its starting position and land it directly in the center of the target circle.
- Accuracy Metrics: The system calculates your final score based on how close the center of the cargo is to the center point of the circle.
- Vertical Control: Use the Hoist/Winch lever to ensure the cargo does not sway as you lower it toward the ground.



18. The path must be in the zigzag, if it's not it won't be counted.

The simulator is programmed with a strict path-tracking algorithm. To pass the evaluation, you must adhere to the designated route.

- Non-Negotiable Trajectory: The cargo must pass between every set of poles in the specific "ZigZac" sequence.
- Checkpoint System: The system utilizes invisible checkpoints; if you attempt to "shortcut" the course by bypassing a pole, the maneuver will not be recognized, and the task will not be marked as complete.
- Validation Logic: Progress is only recorded when the cargo centers through each gap; failing to follow the sequence means the final phase will not trigger.



## 19. Precision Handling and Penalty System

Safety is the highest priority in crane operation. The simulator enforces this through a real-time scoring deduction system.

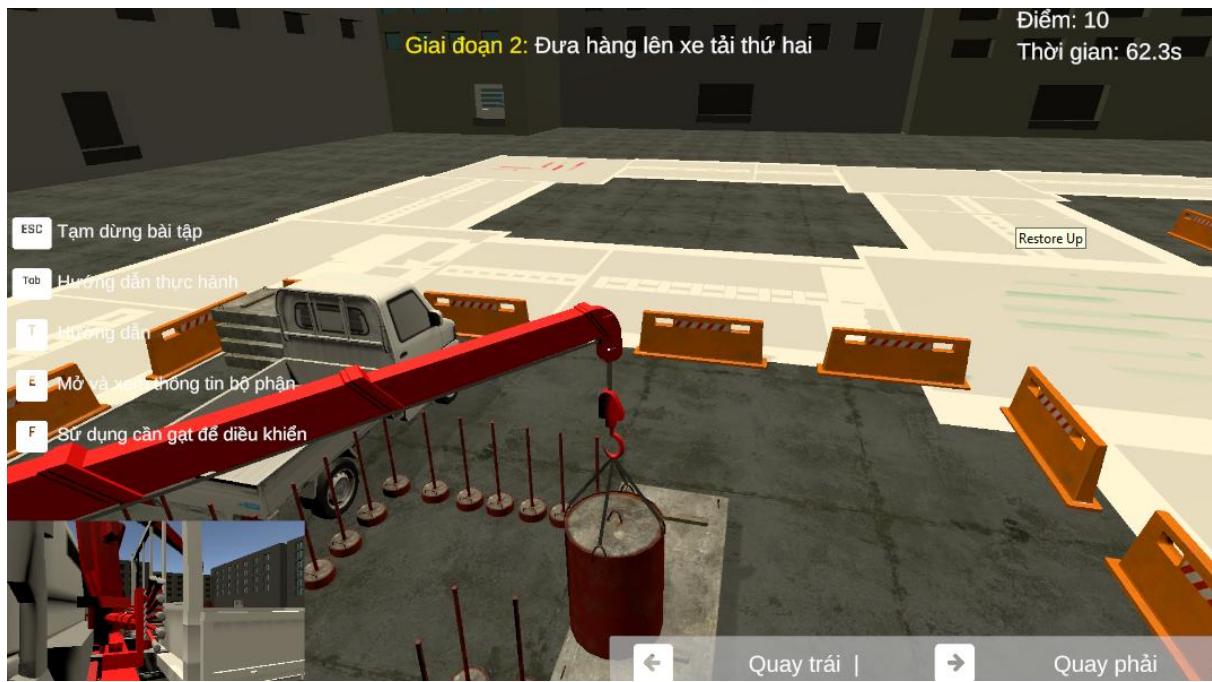
- Collision Detection: The physics engine detects any contact between the cargo, the hook block, or the crane's boom and the boundary poles.
- Scoring Penalties: Each instance of contact results in an immediate -0.5 point deduction from your total performance score.
- Swing Control: You must manage the "pendulum effect" by making small, counter-movements with the levers; excessive cargo swaying is the primary cause of pole collisions.
- Monitoring: Keep a constant eye on the top-right HUD to track your current score during the maneuver.



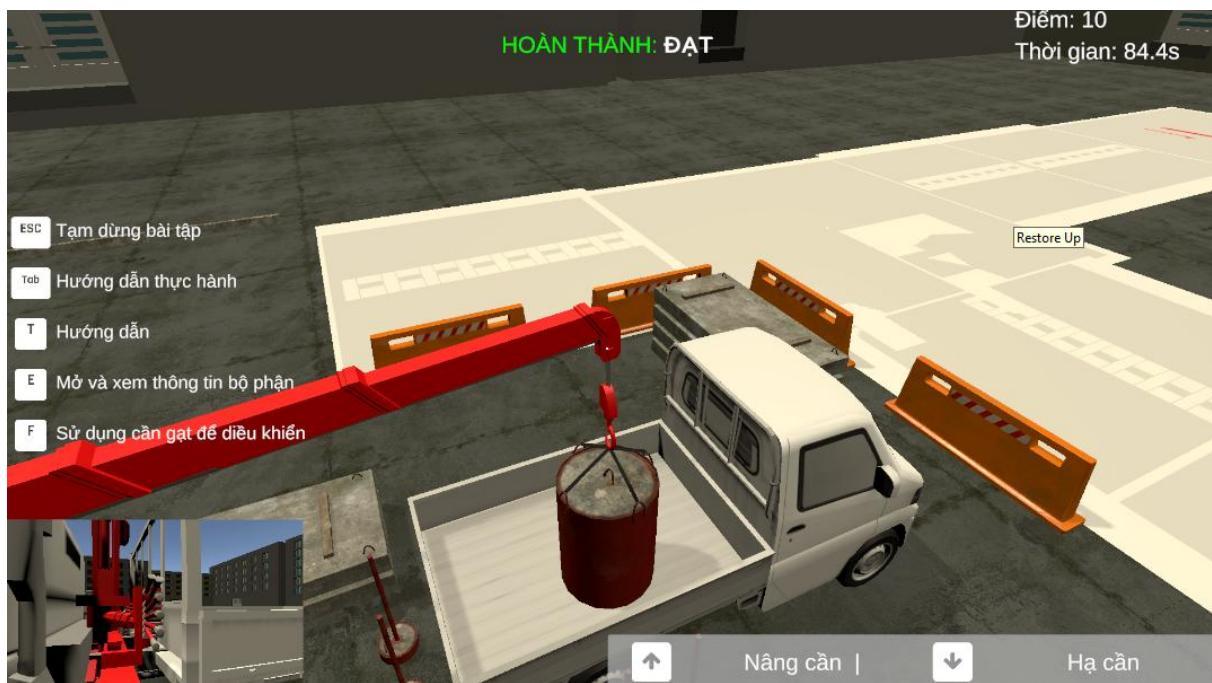
20. Objective Transition: Phase 1 to Phase 2.

The simulator provides clear visual and textual feedback when a major milestone is reached.

- State Change: Once the cargo successfully clears the final "ZigZac" checkpoint, the system will automatically transition to Phase 2.
- Visual Notification: The instruction text on your screen will update to reflect the new objective.

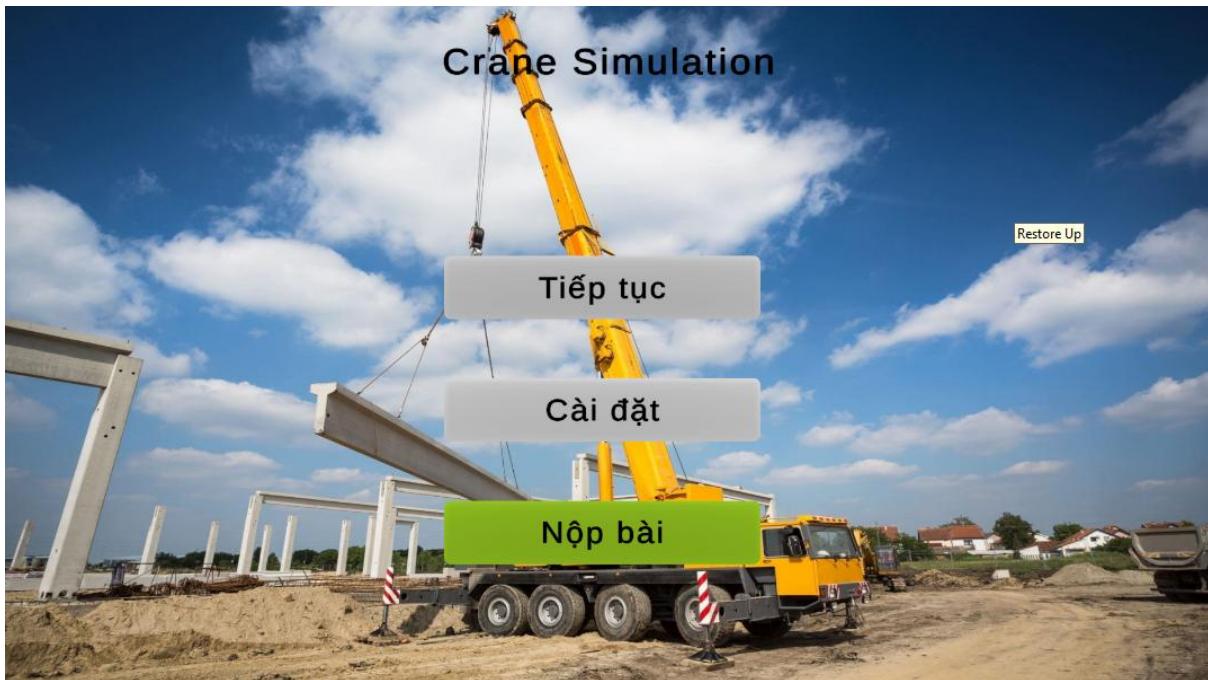


21. Move the cargo to the back of the truck to finish the practice.



22. Final Review and Process Completion.

- Opening the Menu: After placing the cargo, press "ESC" on your keyboard to pause the simulation and open the settings/submission menu.
- Submission ("Nộp bài"): Click the "Nộp bài" button to finalize your attempt and transmit your score, time, and penalty data to the instructor's dashboard.



### 3.3.7 Feature 6: Simulation Management

**Overview:** This feature is the control center for the simulation ecosystem. It allows the **Simulation Manager** to configure physics parameters, manage 3D assets, and design training scenarios. These configurations directly synchronize with the Desktop Client to ensure accurate simulation behavior.

**Actor:** Simulation Manager **Pre-condition:** User must be logged in successfully with the Simulation Manager role.

#### Manage Brand Models (Quản lý Thương hiệu & Model)

- **Description:** Defines the technical specifications (physics profiles) of different crane models. The Unity Client uses these parameters to calculate real-time physics limits.
- **Trigger:** Select "**Thương hiệu và model**" (Brand Models) from the Sidebar.
- **URL:** /simulation-manager/brand-model

#### Usage Steps:

1. **View List:** The interface displays a table of registered crane models.
2. **Create New Model:**
  - Click the "**Tạo mới**" (Create) button on the top right.
  - **[Action]:** A drawer form appears.
  - Input the required fields:
    - **Tên Model** (Model Name): e.g., *SCC550A*.
    - **Tải trọng tối đa** (Max Lifting Capacity): e.g., *55 tons*.
    - **Bán kính tối đa** (Max Radius): e.g., *40m*.
  - Click "**Lưu**" (Save) or "**Xác nhận**" (Submit) to finish.
3. **Edit/Delete:** Click the "**Chỉnh sửa**" (Edit icon) or "**Xóa**" (Delete icon) on specific rows.

#	TÊN	MÔ TẢ	TRẠNG THÁI	THAO TÁC
1	URV 340	A series of truck-mounted cranes with a maximum lifting capacity of 3,030 kg. des...	<b>HOẠT ĐỘNG</b>	
2	LIEBHERR LTM 1030	Liebherr LTM 1030 (hoặc LTM 1030-2, 1030-2.1) là xe cẩu bánh lốp di động (All-Ter...	<b>HOẠT ĐỘNG</b>	

### Create New Brand Model (Tạo mới Thương hiệu & Model)

**Description:** Provides a drawer interface for Simulation Managers to register a new crane model identity (e.g., KATO, SANY) into the system. This establishes the brand profile before physical parameters are configured.

**Trigger:** Click the "Thêm mới" (Create) button (icon dấu cộng +) located at the top-right corner of the management table.

#### Usage Steps:

- [Action]:** A drawer form slides in from the right side of the screen titled "**THÊM MỚI THƯƠNG HIỆU**" (Create Brand Model).
- Input the required fields:**
  - Tên thương hiệu (Brand Name):**
    - Input:** Text field.
    - Validation:** Required, unique in the system (Duplicate Check).
    - Example:** "SANY SCC550A".
  - Mô tả (Description):**
    - Input:** Text Area.
    - Validation:** Optional, max 500 characters.
    - Example:** "Cẩu bánh xích 55 tấn - Model tiêu chuẩn 2024".
  - Trạng thái (Status):**
    - Input:** Toggle Switch.
    - Default:** Active (Hoạt động).
- Submission:** Click "**Lưu**" (Save) to submit the data to the server (POST /api/BrandModels).

#### System Logic (Backend Verification):

- Name Normalization:** The system automatically trims whitespace (e.g., " KATO ") before saving.

- **Integrity Check:** If the entered name already exists, the system returns a 400 Bad Request: "*Tên thương hiệu đã tồn tại*" (Brand name already exists).

X



## TẠO MẪU THƯƠNG HIỆU

### \* TÊN MẪU THƯƠNG HIỆU

Nhập tên mẫu thương hiệu

0 / 100

### MÔ TẢ

Nhập mô tả

0 / 500

### TRẠNG THÁI HOẠT ĐỘNG

Không hoạt động

Hủy

+ Tạo

## Edit Brand Model (Sửa mẫu thương hiệu)

**Description:** Allows authorized users to modify the details of an existing crane model. This function ensures that any updates to the brand identity (Name, Description) do not violate system integrity rules.

**Trigger:** Click the "**Chỉnh sửa**" (Edit - icon bút chì) button on a specific row in the Brand Model list.

### Usage Steps:

1. **[Action]:** The drawer form slides in from the right, titled "**CẬP NHẬT THƯƠNG HIỆU**" (Edit Brand Model).
2. **Data Population:** The form automatically pre-fills with the selected model's current information:
  - **Tên thương hiệu (Brand Name):** Displays current name (e.g., "SANY SCC550A").
  - **Mô tả (Description):** Displays current description.
  - **Trạng thái (Status):** Shows the current Active/Inactive switch state.
3. **Modification:** User updates the desired fields.
  - *Input:* Text field / Text Area / Switch.
  - *Validation:* Standard validation rules apply (Required, Max length).
4. **Submission:** Click "**Cập nhật**" (Save/Update) to commit changes to the server (PUT /api/BrandModels/{id}).

### System Logic (Backend Verification):

- **Existence Check:** The system verifies if the record exists and has not been deleted.
- **Self-Exclusion Duplicate Check:** The system checks if the new name exists in the database *excluding the current record itself*.
  - *Logic:* if (Name == NewName AND Id != CurrentId) -> Error.
  - *Purpose:* Allows the user to keep the same name while updating the description, but prevents renaming the model to a name that belongs to another brand.



## SỬA MẪU THƯƠNG HIỆU

\* TÊN MẪU THƯƠNG HIỆU

URV 340

7 / 100

### MÔ TẢ

A series of truck-mounted cranes with a maximum lifting capacity of 3,030 kg, designed for medium-duty trucks. Available in multiple models differentiated by boom sections and working radius, including URV 342, URV 343, URV 344, URV 345, and URV 346.

250 / 500

### TRẠNG THÁI HOẠT ĐỘNG

Hoạt động



Hủy

Cập nhật

Delete Brand Model (Xóa mẫu thương hiệu)

**Description:** Allows the removal of a crane model from the active system. This action is protected by strict dependency checks to prevent breaking simulation configurations.

**Trigger:** Click the "Xóa" (Delete - icon thùng rác) button on a specific row.

#### Usage Steps:

1. **[Action]:** A confirmation dialog appears asking the user to confirm the deletion.
2. **Confirmation:** Click "Xóa" (Confirm) to proceed.
3. **Result:** The record is removed from the table view.

#### System Logic (Critical Integrity Rule):

- **Dependency Check:** Before deletion, the backend scans the SimulationComponents table.
- **Blocking Rule:** If this Brand Model is currently linked to any Simulation Component (used in physics calculations), the system **BLOCKS** the deletion and returns an error: "*Cannot delete brand model that has simulation components.*".
- **Soft Delete:** If no dependencies exist, the system performs a "Soft Delete" (sets IsDeleted = true) to preserve historical data integrity.

### Manage Simulation Tasks (Quản lý Nhiệm vụ Mô phỏng)

**Description:** Allows the Simulation Manager to define a library of atomic tasks (objectives) such as "Lift Cargo", "Navigate Zigzag", or "Emergency Stop". These tasks serve as building blocks that are later assigned to specific Practice Sessions.

**Trigger:** Select "Nhiệm vụ thực hành" (Task Practice) from the Simulation Manager Sidebar.

#### View Task List (Xem Nhiệm vụ Mô Phỏng)

#### Usage Steps:

1. **Access:** The page loads the list of existing tasks via API GET /api/Tasks/paged.
2. **View Modes:** Users can toggle between **Table View** and **Card View** using the toggle button at the top right.
3. **Display Data:**
  - **Task Name:** Descriptive name (e.g., "Nâng hàng an toàn").
  - **Task Code:** Unique identifier (e.g., "TASK-001").
  - **Description:** Operational details.
  - **Expected Result:** The criterion for success (e.g., "Cargo placed within 5cm of target").

#	MÃ NHIỆM VỤ	TÊN NHIỆM VỤ	KẾT QUẢ MONG ĐỢI	THAO TÁC
1	TASK_UNKNOWN_2111	Task Test 18:13 PM 3/11/2025	Task Test 18:13 PM 3/11/2025	
2	TASK UNKNOWN_X	Task Test 18:15 PM 3/11/2025	Task Test 18:15 PM 3/11/2025	
3	TASK_UNKNOWN_A	Position the Crane	Crane correctly aligned and ground is stable.	
4	TASK_UNKNOWN_B	Deploy Outriggers	Outriggers fully extended with balanced load distribution.	
5	TASK_UNKNOWN_C	Place Packing Pads	Pads centered and stable.	
6	TASK_UNKNOWN_E	Measure Radius	Radius measured within ±0.2m.	
7	TASK_UNKNOWN_F	Check Load Chart	Capacity within safe limits.	

1-10 / 29 quản lý nhiệm vụ | < | 1 | 2 | 3 | > | 10 / page |

## Create New Task (Tạo mới Nhiệm vụ)

### Usage Steps:

- Trigger:** Click the "CREATE TASK" button (or icon +) at the top right.
- Action:** A drawer form slides in titled "CREATE NEW TASK".
- Input the required fields :**
  - Tên nhiệm vụ (Task Name):**
    - Validation:** Required, Max 100 chars.
  - Mã nhiệm vụ (Task Code):**
    - Validation:** Required, Max 50 chars, Must be unique.
    - Example:** "LIFT-OP-01".
  - Mô tả (Description):**
    - Validation:** Optional, Max 500 chars.
  - Kết quả mong đợi (Expected Result):**
    - Validation:** Optional, Max 100 chars.
- Submission:** Click "Create" (Tạo ) to submit to POST /api/Tasks.

### System Logic (Backend Verification - TasksService.cs):

- Uniqueness Check:** The system verifies if TaskCode already exists (case-insensitive). If duplicated, it throws an error: "Task code '{code}' already exists."
- Data Cleaning:** Automatically trims whitespace from all text inputs.

  **TẠO NHIỆM VỤ**

**\* TÊN NHIỆM VỤ**

Nhập tên nhiệm vụ

0 / 100

**\* MÃ NHIỆM VỤ**

Nhập mã nhiệm vụ

0 / 50

**MÔ TẢ NHIỆM VỤ**

Nhập mô tả nhiệm vụ

0 / 500

**KẾT QUẢ MONG ĐỢI**

Nhập kết quả mong đợi

0 / 150

Hủy

+ Tạo

**Edit Task (Cập nhật Nhiệm vụ)**

**Usage Steps:**

- Trigger:** Click the "Edit" (Pencil icon) on a task card or table row.
- Action:** The drawer opens with title "EDIT TASK", pre-filled with current data.

3. **Modification:** Update fields as needed. Note that TaskCode can be changed but must remain unique across the system.
4. **Submission:** Click "**Update**" to save changes (PUT /api/Tasks/{id}).

**Business Rules:**

- **Self-Exclusion Check:** When checking for duplicate TaskCode, the system ignores the current task being edited.

  **SỬA NHIỆM VỤ**

---

\* **TÊN NHIỆM VỤ**

Deploy Outriggers

17 / 100

\* **MÃ NHIỆM VỤ**

TASK\_UNKNOWN\_B

14 / 50

**MÔ TẢ NHIỆM VỤ**

Extend outriggers evenly and lower them to ensure chassis stability.

68 / 500

**KẾT QUẢ MONG ĐỢI**

Outriggers fully extended with balanced load distribution.

58 / 150

---

Hủy

Cập nhật

## Delete Task (Xóa Nhiệm vụ)

### Usage Steps:

1. **Trigger:** Click the "Delete" (Trash icon) on a task.
2. **Confirmation:** A modal appears: "Are you sure you want to delete {taskName}?".
3. **Action:** Click "Delete" to confirm.

### System Logic (Critical Integrity Rule):

- **Dependency Block:** The backend (TasksService.cs) checks if this Task is currently assigned to any Practice Scenario (PracticeTasks table).
- **Rule:** If the task is in use, the system **BLOCKS** the deletion and returns an error: "Cannot delete a task associated with one or more practices."
- **Soft Delete:** If safe to delete, the system sets IsDeleted = true.

## Manage Simulation Practices (Quản lý Bài Thực hành Mô phỏng)

**Description:** Allows Simulation Managers to define complete practice scenarios by combining metadata (Duration, Difficulty) with specific operational tasks. These practices are the core content assigned to trainees for simulation training.

**Trigger:** Select "Bài thực hành" (Practices) from the Simulation Manager Sidebar.

**URL:** /simulation-manager/practices

### View Practice List

### Usage Steps:

1. **Access:** Upon loading the page, the system automatically fetches the list of existing practices.
2. **Display Data:** The table displays the following information:
  - **Mã bài thực hành (Practice Code):** Unique identifier for the scenario (e.g., "PRAC-001").
  - **Tên bài thực hành (Practice Name):** The descriptive title of the practice (e.g., "Vận hành cầu cơ bản").
  - **Thời lượng (Duration):** Estimated time required to complete the practice (in minutes).
  - **Độ khó (Difficulty):** The skill level required, visualized by color-coded badges:
    - *Entry* (Easy/Green)
    - *Intermediate* (Medium/Yellow)
    - *Advanced* (Hard/Red)
  - **Số lần thử (Max Attempts):** The maximum number of retries allowed for a trainee.
  - **Trạng thái (Status):** Indicates availability (*Active* / *Inactive*).

3. **Actions:** Users can click the **Edit icon** (Eye/Pencil) to view details or the **Delete icon** (Trash bin) to remove a practice.

#	MÃ BÀI THỰC HÀNH	TÊN BÀI THỰC HÀNH	THỜI LƯỢNG (PHÚT)	ĐỘ KHÓ	SỐ LẦN THỬ TỐI ĐA	TRẠNG THÁI	HÀNH ĐỘNG
1	PRACTICE_03	OUTRIGGER DEPLOYMENT DRILL	60	ENTRY	5	KHÔNG HOẠT ĐỘNG	
2	PRACTICE_04	LOAD RADIUS PRACTICAL	60	ENTRY	5	KHÔNG HOẠT ĐỘNG	
3	PRACTICE_05	CRANE OPERATION	150	ENTRY	5	KHÔNG HOẠT ĐỘNG	
4	PRACTICE_06	STANDARD SIGNALS ROLEPLAY	45	ENTRY	5	KHÔNG HOẠT ĐỘNG	
5	PRACTICE_07	EMERGENCY RESPONSE SIMULATION	60	ENTRY	5	KHÔNG HOẠT ĐỘNG	
6	PRACTICE_08	WATERFALL DRAKE	60	ENTRY	5	KHÔNG HOẠT ĐỘNG	

1-10 / 10 bài thực hành mô phỏng

### Create New Practice (Tạo mới Bài thực hành)

#### Usage Steps:

- Trigger:** Click the "**Tạo mới**" (Create) button (icon +) at the top-right corner of the page.
- [Action]:** The system navigates to the Create Practice form (/practices/create).
- Input the required fields :**
  - **Tên bài thực hành (Practice Name):**
    - *Input:* Text field.
    - *Validation:* Required, max 200 characters.
  - **Mã bài thực hành (Practice Code):**
    - *Input:* Text field.
    - *Validation:* Required, max 50 characters, must be uppercase and unique.
  - **Mô tả (Description):**
    - *Input:* Text Area.
    - *Validation:* Optional, max 1000 characters.
  - **Thời lượng (Duration):**
    - *Input:* Number field.
    - *Unit:* Minutes.
  - **Độ khó (Difficulty):**
    - *Input:* Dropdown menu.
    - *Options:* Entry, Intermediate, Advanced.
  - **Số lần thử (Max Attempts):**
    - *Input:* Number field.
    - *Constraint:* Must be between 1 and 10.
  - **Trạng thái (Active):**
    - *Input:* Toggle Switch.

- *Default:* Active (On).
- 4. **Submission:** Click "Tạo bài thực hành" (Save) to submit the data.

### System Logic:

- **Duplicate Check:** The system verifies if the PracticeCode already exists in the database. If a duplicate is found, it returns an error: "*Practice code already exists.*"

The screenshot shows a web-based application interface for creating a new practice. The main window has a title bar 'TAO BÀI THỰC HÀNH MỚI' and a sub-instruction 'Thêm một module bài thực hành mới phòng mới'. The left sidebar includes navigation links for 'TỔNG QUAN', 'THỰC HÀNH' (highlighted), 'CAI ĐẶT NHIỆM VỤ', and 'THƯƠNG HIỆU & MÔ...'. The main content area is divided into sections: 'THÔNG TIN CƠ BẢN' (Basic Information) and 'TÓM TẮT' (Summary). The 'THÔNG TIN CƠ BẢN' section contains fields for 'TÊN BÀI THỰC HÀNH' (Name), 'MÃ BÀI THỰC HÀNH' (Code), 'MÔ TẢ' (Description), 'THỜI LƯỢNG ƯỚC TÍNH (PHÚT)' (Duration), 'MỨC ĐỘ KHÓ' (Difficulty), 'SỐ LẦN THỬ TỐI ĐA' (Max Attempts), and 'TRẠNG THÁI' (Status). The 'TÓM TẮT' section displays a summary of tasks: 'THỜI LƯỢNG' (1 min), 'ĐỘ KHÓ' (N/A), 'SỐ LẦN THỬ TỐI ĐA' (1), and 'TRẠNG THÁI' (HOẠT ĐỘNG). At the bottom, there are 'Tạo bài thực hành' (Create Practice) and 'Hủy' (Cancel) buttons.

### Edit Practice & Manage Tasks (Cập nhật & Gán Nhiệm vụ)

**Description:** This interface allows updating practice metadata and assigning specific operational tasks (from the Task Library) to the practice.

**Trigger:** Click the "Chi tiết" (View/Edit) button on a specific row in the list.

### Usage Steps:

#### A. Edit General Information:

1. Modify the fields in the "Thông tin cơ bản" (Basic Information) section.
2. Click "Lưu thay đổi" (Save Changes) to update the metadata.

#### B. Assign Tasks (Task Configuration):

1. **Trigger:** Scroll to the "Danh sách nhiệm vụ" (Task List) section and click "Thêm nhiệm vụ" (Add Task / Assign Task).
2. **Selection:** A modal appears listing available tasks from the library.
3. **Action:** Check the boxes next to the desired tasks (e.g., "Nâng hàng", "Di chuyển zig-zag").

- Note: Tasks already assigned to this practice are hidden or disabled to prevent duplicates.
4. **Confirm:** Click "Gán" (Assign) to link the selected tasks to the practice.  
5. **Remove Task:** To unassign a task, click the **Delete icon** on the specific task row within the list.

## CẬP NHẬT BÀI THỰC HÀNH

\* TÊN BÀI THỰC HÀNH  
Outrigger Deployment Drill 26 / 200

MÃ BÀI THỰC HÀNH  
PRACTICE\_03 11 / 50

MÔ TẢ  
Set, level, and pack outriggers for varied ground conditions. 61 / 1000

THỜI GIAN ƯỚC TÍNH (PHÚT) \* ĐỘ KHÓ  
60 Cơ bản

SỐ LẦN THỬ TỐI ĐA TRẠNG THÁI  
5 Không hoạt động

Hủy ✓ Sửa

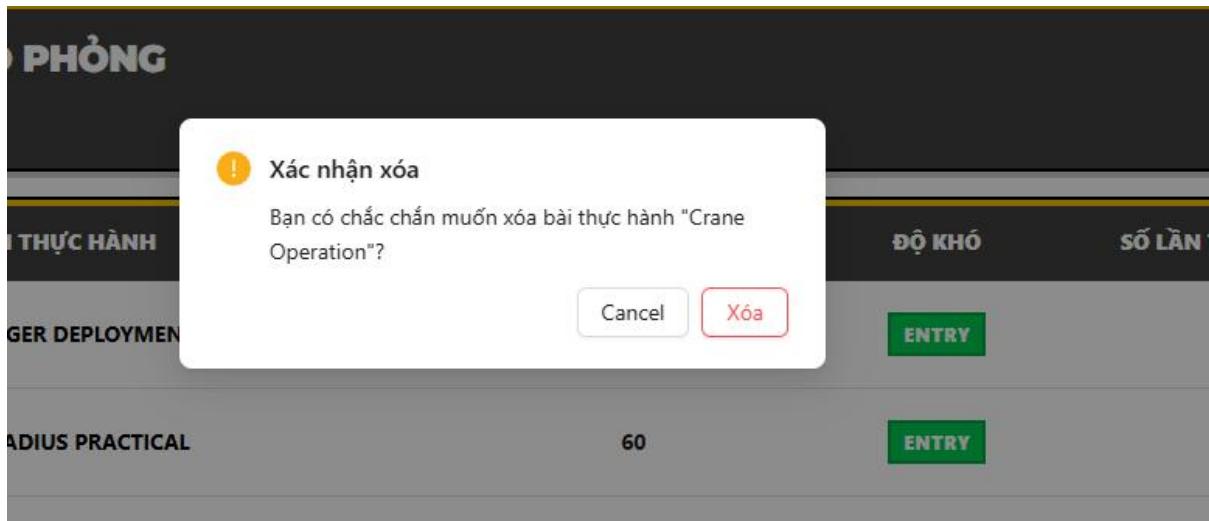
Delete Practice (Xóa Bài thực hành)

Usage Steps:

- Trigger:** Click the "Xóa" (Delete) button (icon Trash bin) on a specific row in the main list.
- Confirmation:** A dialog appears asking: "Bạn có chắc chắn muốn xóa bài thực hành này?" (Are you sure you want to delete this practice?).
- Action:** Click "Xóa" (Confirm) to proceed.

#### System Logic (Integrity Check):

- Dependency Block:** The backend checks if this Practice is currently linked to any active **Training Curriculum** (Activities).
- Rule:** If the practice is in use, the system **BLOCKS** the deletion to prevent breaking the course structure.



#### Simulation Manager Dashboard (Bảng điều khiển quản lý mô phỏng)

**Description:** Provides a comprehensive analytical view of the simulation training system. It aggregates real-time data regarding trainees, practice scenarios, and system usage to help managers assess training throughput and effectiveness.

**Trigger:** Select "**Tổng quan**" (Dashboard) from the Simulation Manager Sidebar.

**URL:** /simulation-manager/dashboard

#### System Overview Statistics (Thống kê tổng quan)

##### Usage Steps:

- Access:** Upon accessing the dashboard, the top section ("StatsOverview") automatically loads data from the server.
- Display Data:** Four key metric cards are displayed:
  - Tổng học viên (Total Trainees):** Total number of active trainees in the system.
  - Tổng thực hành (Total Practices):** Total number of practice scenarios defined.
  - Tổng nhiệm vụ (Total Tasks):** Total number of atomic tasks available in the library.
  - Tổng phiên mô phỏng (Total Simulation Sessions):** Cumulative count of all practice attempts made by trainees.

#### System Logic (Backend Analysis - SimulationManagerDashboardService.cs):

- Data Aggregation:** The system queries the database using CountAsync filters.
- Exclusion Rule:** All queries strictly filter out deleted records (IsDeleted == false) to ensure accuracy.
- Role Validation:** The backend enforces a security check to ensure the requesting user has the SimulationManager role before returning data.



#### Monthly Practice Completion Analytics (Phân tích hoàn thành thực hành)

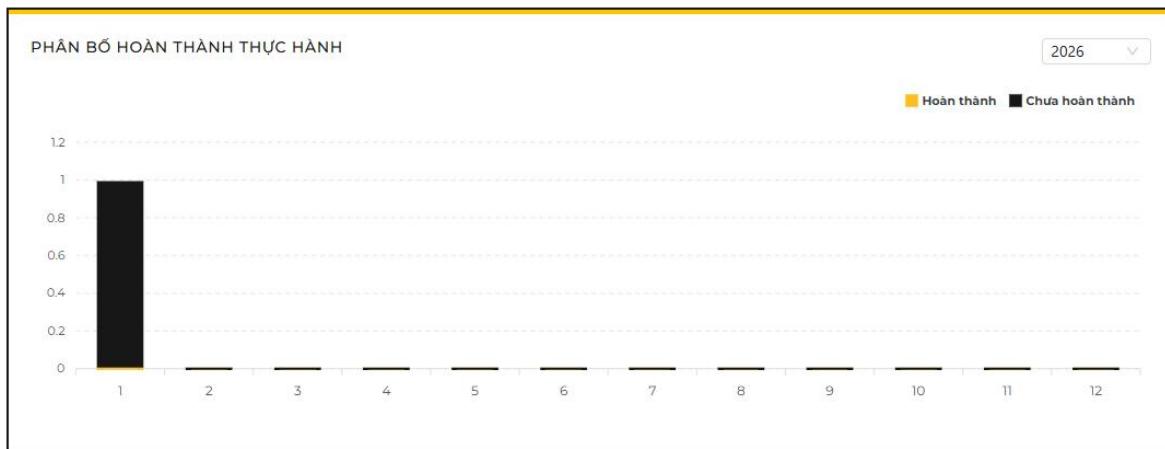
**Description:** A chart visualization showing the trend of successful vs. failed practice attempts over the months of a selected year.

#### Usage Steps:

- View Chart:** A bar chart displays two datasets per month:
  - Completed (Hoàn thành):** Number of attempts where the trainee passed (IsPass == true).
  - Not Completed (Chưa hoàn thành):** Number of attempts failed (IsPass == false).
- Filter by Year:** Use the year selector (Dropdown/Input) at the top of the chart to change the reporting period (Default is the current year).

#### System Logic:

- API Call:** GET /api/simulation-manager/dashboard/completion-distribution?year={year}.
- Grouping:** Data is aggregated from the PracticeAttempts table, grouped by Month.
- Metric Definition:** "Completion" is strictly defined by the IsPass boolean flag in the database attempt record.



### Practice Duration Distribution (Phân bố thời lượng thực hành)

Description:

A pie/donut chart categorizing simulation sessions based on the complexity/length of the practices being attempted. This helps managers understand if trainees are focusing on short drills or long, complex scenarios.

Usage Steps:

- View Distribution:** The chart segments usage into three categories:
  - **Fast (< 15 mins):** Short exercises.
  - **Moderate (15-45 mins):** Standard training sessions.
  - **Slow (> 45 mins):** Long/Complex scenarios.
- Interaction:** Hover over chart segments to see the exact count of trainees/attempts in each category.

System Logic (Code Insight):

- **Classification Source:** The category is determined by the **Estimated Duration** (`EstimatedDurationMinutes`) defined in the *Practice configuration*, not the actual time the student spent.
  - *Logic:* `Join(PracticeRepository) Check EstimatedDuration.`
- **Buckets:**
  - Fast: Duration < 15.
  - Moderate:  $15 \leq \text{Duration} \leq 45$ .
  - Slow: Duration > 45.

## PHÂN BỐ THỜI LƯỢNG THỰC HÀNH

Tổng

0

🟡 Fast (< 15 mins) ● Moderate (15-45 mins) ● Slow (> 45 mins)

### 3.3.8 Feature 7: Trainee Learning Portal

**Overview:** This feature serves as the primary interface for trainees to engage with the training program. It consolidates daily schedules, course materials (video/documents), simulation practice tracking, assessments, and certification. The system enforces progression rules (e.g., video completion triggers) to ensure training integrity.

**Actor:** Trainee **Pre-condition:** User must be logged in successfully with the **Trainee** role.

#### View Weekly Schedule (Xem Lịch học)

**Description:** Allows trainees to view their assigned class sessions. The system organizes time slots into a weekly grid view, helping trainees track upcoming theory lessons or simulation practice sessions. **Trigger:** Select "Lịch học" (Schedule) from the Sidebar. **URL:** /trainee/schedule

#### Usage Steps:

1. View Weekly Grid:
  - The interface calculates the current week (starting Monday) and displays a calendar grid.
  - Columns represent days (Monday - Sunday), and rows represent assigned Time Slots (e.g., Slot 1: 07:00 - 09:15).

- [System Logic]: The system calls GET /api/timeslots/trainee/weekly with the dateInWeek parameter to fetch relevant sessions.
2. Navigation:
    - Click the "<" (Previous) or ">" (Next) buttons to navigate between weeks.
    - Click "Hôm nay" (Today) to return to the current week.
  3. Session Details:
    - Occupied slots display the Class Name, Room/Lab location, and Attendance Status (e.g., "Có mặt", "Vắng").

LSSCTC ACADEMY • LỊCH HỌC

## LỊCH HỌC CỦA BẠN

Xem lịch học hàng tuần và quản lý thời gian học tập hiệu quả

**TUẦN 12/1 - 18/1**

2026

Hôm nay

SLOT	MONDAY 12/1	TUESDAY <b>13/1</b> <b>TODAY</b>	WEDNESDAY 14/1	THURSDAY 15/1	FRIDAY 16/1	SATURDAY 17/1	SUNDAY 18/1
<b>SLOT 1</b> 07:00 - 09:00	—	—	—	—	<b>BUỔI 1</b> Buổi 1 NOTSTARTED P.218	—	<b>BUỔI 2</b> Buổi 2 NOTSTARTED P.218
<b>SLOT 2</b> 09:15 - 11:15	—	—	—	—	—	—	—

#### 4. Attendance List:

- Click onto the “Attendance” or “Điểm danh” button to navigate to all of your attendance records in the class

lssctc.site/my-classes/39

TRANG CHỦ CHƯƠNG TRÌNH MÔ PHÒNG GIỚI THIỆU

Điểm danh

Học tập	Lịch học lớp	Điểm danh	Thi Cuối Khóa
Buổi 1 08:45 AM - 09:03 AM	23/12/2025	P.218 - Trung Tâm Đào Tạo Quận 9	Chưa bắt đầu

## Learn Course Material (Học tập)

**Description:** The core learning interface where trainees consume lecture videos and reading materials. The system tracks engagement time and automatically updates progress status based on specific completion thresholds. **Trigger:** Select a specific Class > Course > Section > Activity from the "Program" menu. **URL:** /trainee/learn/:courseId/:sectionId/:partitionId

### Usage Steps:

#### 1. Access Content:

- The sidebar displays the course curriculum tree (Sections and Activities).
- Click on a "Video" or "Document" activity to load the content.

#### 2. Watch Video (Video Material):

- The embedded video player loads the lecture URL (supports YouTube integration).
- [Constraint]: The system monitors the timeUpdate event.
- [Business Rule]: The activity is marked as "**Completed**" only when the viewing progress reaches  $\geq 95\%$ . A notification "User watched the video completely" is logged, and the status is synced to the backend.

#### 3. Read Document:

- For PDF/Text materials, the interface displays the content directly.
- Click the "Hoàn thành" (Mark as Done) button (if manual completion is enabled) to update progress.



The screenshot shows a web-based learning platform interface. At the top, there's a navigation bar with back, forward, and search icons, followed by the URL 'lsstc.site/learnings/44/98/74'. Below the URL is a progress bar indicating '0% COMPLETE'. The main content area has a yellow header with the title 'CS - XỬ LÝ SỰ CỐ & THU DỌN...' and a 'VIDEO' button. To the right, it says 'In Progress'. The video player shows a man in a white shirt and hard hat standing next to a white van with 'liberty' branding. The sidebar on the left lists several activities: 'XỬ LÝ CÁC SỰ CỐ KHẨN...', 'Hậu quả & Xử lý khi cầu chì...', 'QUY TRÌNH THU DỌN (PA...)', and 'Vận hành & Thu cầu UNIC'. Each activity has a small icon and a brief description.

### Take Quiz (Làm bài kiểm tra)

**Description:** Trainees take multiple-choice assessments to validate their knowledge. The system manages attempt limits, calculates scores in real-time, and provides immediate feedback. **Trigger:** Select a "Quiz" activity from the Course Sidebar. **URL:** /trainee/learn/.../quiz/:quizId

#### Usage Steps:

1. **View Quiz Info:**
  - The start screen displays: Quiz Title, Description, Time Limit, and Remaining Attempts (calculated via MaxAttempts - CurrentAttempts).
2. **Attempt Quiz:**
  - Click "Bắt đầu làm bài" (Start Quiz).
  - Select answers for each question. The system supports Single Choice and Multiple Choice formats.
  - A countdown timer (HeaderTimer) tracks the remaining time.
3. **Submit & Review:**
  - Click "Nộp bài" (Submit). The system calculates the score based on: (Correct Answers / Total Questions) \* 10.
  - **Pass/Fail Logic:** If Score ≥ PassingScore, the activity status updates to "Passed".
  - The "Result" screen displays the final score and allows reviewing answers (if configured).

Landing page showing course navigation and progress:

- YOUR PROGRESS: 0/8
- 0% COMPLETE
- Module 1: LỚP ĐIỀU KHIỂN CẨM CẤU (0/2)
- Module 2: ĐẶC TÍNH KỸ THUẬT VÀ... (0/2)
- Module 3: THỰC HIỆN MÔ PHÒNG... (0/4)

**BIỂU ĐỒ TẢI TRỌNG QUIZ**

0/5 ANSWERED

19:52

**Submit**

1 TRONG BIỂU ĐỒ TẢI TRỌNG, "TẦM VƯƠN" (WORKING RADIUS) ĐƯỢC TÍNH THẾ NÀO?

UNANSWERED

Biểu đồ tải trọng

Từ ghế ngồi vận hành đến vật nâng.

Chiều dài thực tế của cần (Boom Length).

Khoảng cách ngang từ tâm quay đến trọng tâm vật nâng.

Từ chân chống trước đến vật nâng.

2 KHI TẦM VƯƠN (BÁN KÍNH) CÀNG LỚN, SỨC NĂNG CHO PHÉP THAY ĐỔI RA SAO?

UNANSWERED

Biểu đồ tải trọng

Start Quiz

**ATTEMPT HISTORY (1)**

#1 13/01/2026 10:20 LATEST

Score: 0 / 10

FAILED

Quiz details:

QUIZ

BIỂU ĐỒ TẢI TRỌNG QUIZ

Bài kiểm tra này nhằm đánh giá khả năng đọc hiểu và phân tích Biểu đồ tải trọng (Load Chart) - tài liệu kỹ thuật quan trọng nhất để vận hành xe cầu an toàn. Học viên cần chứng minh sự hiểu biết về các giới hạn vật lý của thiết bị để tránh các sự cố lật xe hoặc gây chấn thương.

TIME LIMIT: 20 mins

QUESTIONS: 5

PASS SCORE: 5/10

ATTEMPTS: 2/2

INSTRUCTIONS

- Read each question carefully before answering
- You can navigate between questions
- The quiz will auto-submit when time runs out
- Make sure you have a stable internet connection

ATTEMPT LIMIT REACHED

You have used all available attempts for this quiz.

Start Quiz

## View & Take Final Exam (Thi cuối khóa)

**Description:** Trainees shall see their available status for the final exam of a specific class, and they can check related information with the final exam policy or results.

### Usage steps:

1. Navigate to a specific class that you are enrolled in.
2. Click “Final exam” or “Thi cuối khóa”

The screenshot shows the LSSCTC website's main dashboard. At the top, there is a banner with the text "Tiêu Chuẩn LSSCTC", "Tỷ Lệ 95%", "+40% Lương", and "6 Tuần". Below the banner, there is a navigation bar with tabs: "Học tập", "Lịch học lớp", "Điểm danh", and "Thi Cuối Khóa". The "Thi Cuối Khóa" tab is highlighted with a yellow underline.

3. View the final exam open status and your prerequisites (if there is any). Final exam open status should be one of “Open” (Đang mở), “Not yet” (Chưa mở), “Closed” (Đã đóng).

The screenshot shows the "Thi Cuối Khóa" page. At the top, it displays "BÀI THI CUỐI KHÓA" and "OPEN". Below this, there is a message: "ĐỦ ĐIỀU KIỆN THI CUỐI KHÓA" and "Bạn đã hoàn thành tất cả các yêu cầu của khóa học và có thể bắt đầu bài thi cuối khóa." A green checkmark icon is shown next to the message.

4. View the final exam detail partials and the specific date that the training center provides.

The screenshot shows the "CÁC PHẦN THI" section. It lists three exam types: "Theory", "Simulation", and "Practical". Each row includes the exam type, duration (15 Phút, 60 Phút), current status ("CHUA LÀM"), and a "KHUNG THỜI GIAN" column. The "KHUNG THỜI GIAN" column for Theory shows "24-12-2025" and "24-12-2025". The "BẮT ĐẦU THI" button is highlighted with a yellow background and black text. The "Simulation" and "Practical" rows show similar information with their respective durations and current status.

5. Follow instructor guide and allowance to attempt the exam. Usually, you should be appeared at a target place which is notified by the training center before the attempt.

6. Theory Exam requires access code (Mã làm bài) which is provided by instructor or center staff.

THEORY EXAM

THỜI GIAN  
**15 phút**

WEIGHT  
**30%**

MARKS  
**0**

TRẠNG THÁI  
**NOT YET**

START TIME  
lúc 21:10 24 tháng 12, 2025

NHẬP MÃ MỞ ĐỀ ĐỂ BẮT ĐẦU

MÃ MỞ ĐỀ

Nhập mã mở đề

7. Simulation Exam is taken inside simulation engine in the same way with simulation practice.

8. Practical Exam is graded by instructor or assigned examiner. Trainees shall follow instructor / examiner steps to finish the practical exam.

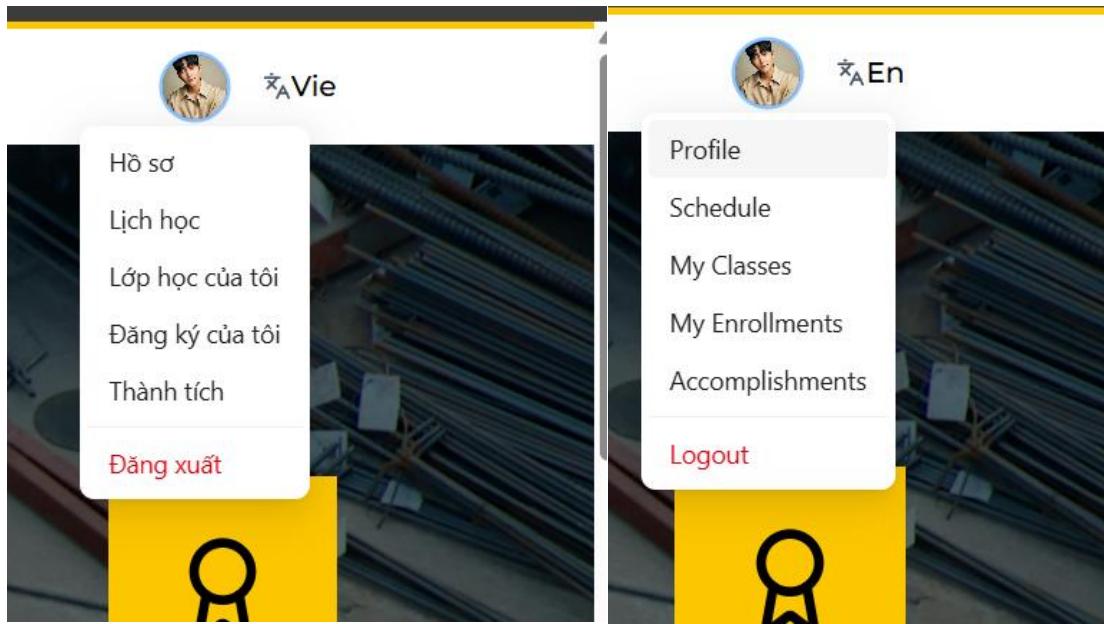
### View & Download Certificate (Chứng chỉ)

**Description:** A display of all certifications earned by the trainee upon completing courses. It provides visual indicators for certificate validity and allows downloading the official certificate file. **Trigger:** Select "Chứng chỉ" (Certificates) from the Sidebar. **URL:** /trainee/certificates

#### Usage Steps:

##### 1. View List:

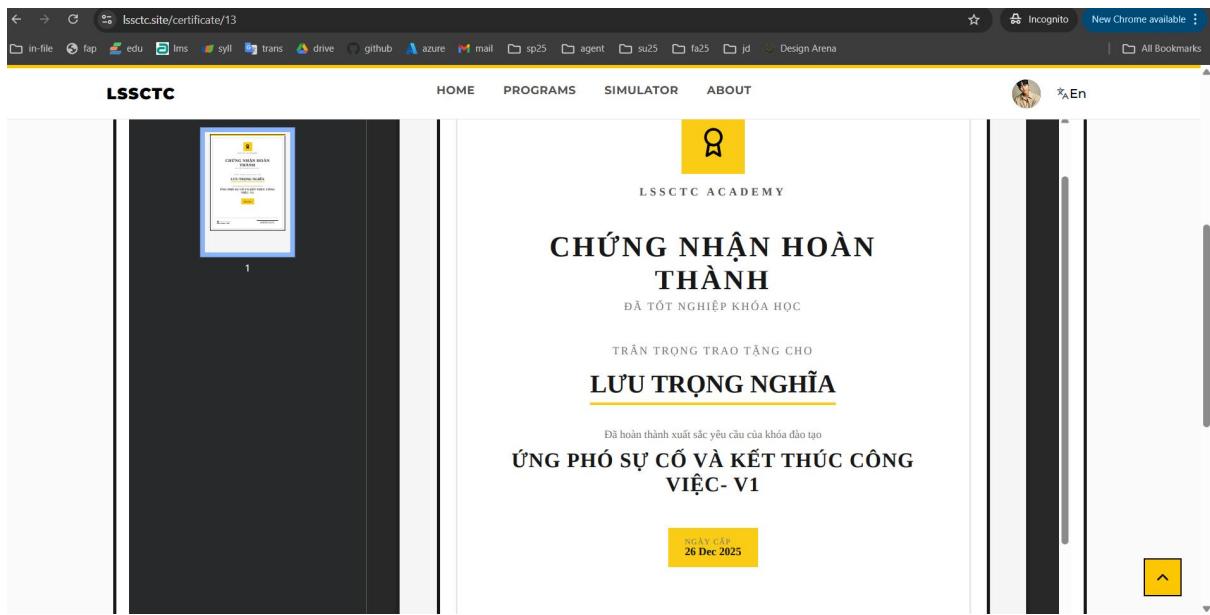
- Click on user avatar and select Accomplishments / Thành tích.



- The page displays cards for each earned certificate containing: Course Name, Issue Date, and Expiration Date.

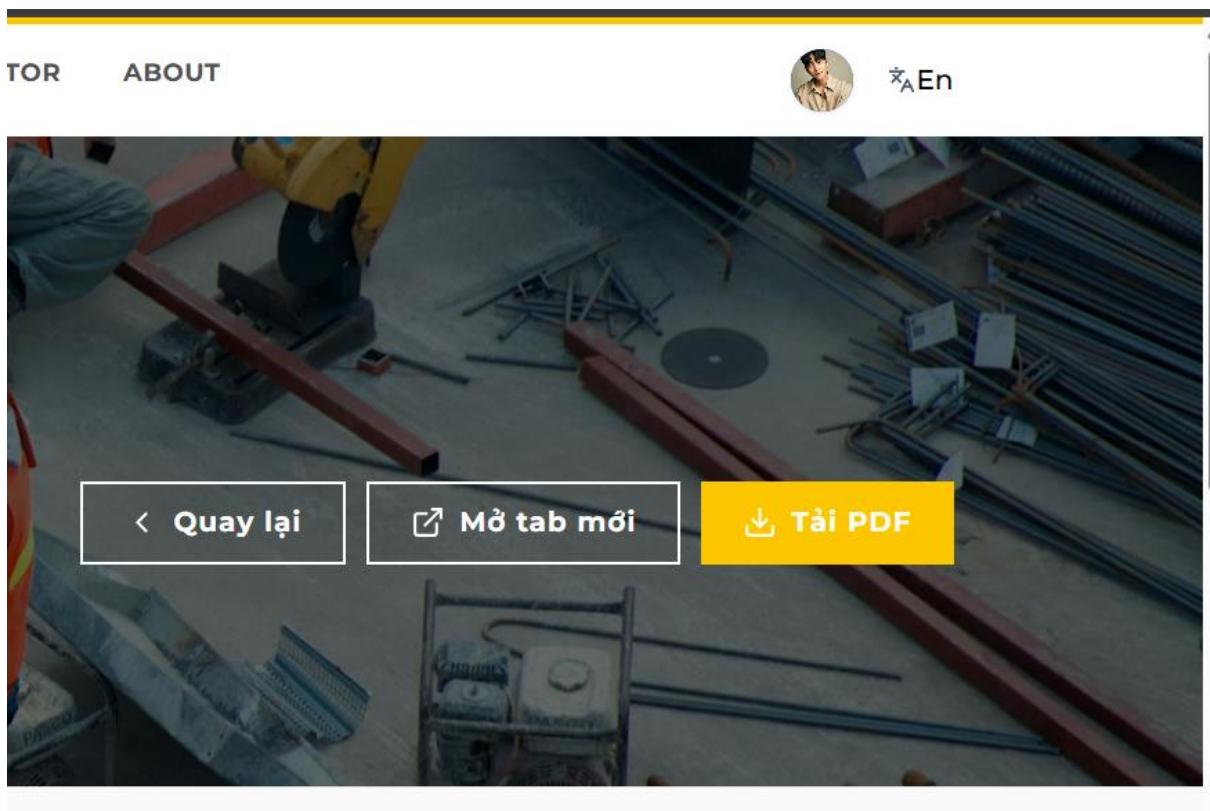
## 2. Detail Preview:

- Click on a specific certificate to see the detail preview on website, information included in a certificate should includes:
  - Valid:** Displayed with a **Yellow/Standard** badge if the expiration date is far in the future.
  - Expiring Soon:** Displayed with an **Amber** badge if the certificate expires in less than **90 days**.
  - Expired:** Displayed with a **Red** badge if **ExpireDate < CurrentDate**.

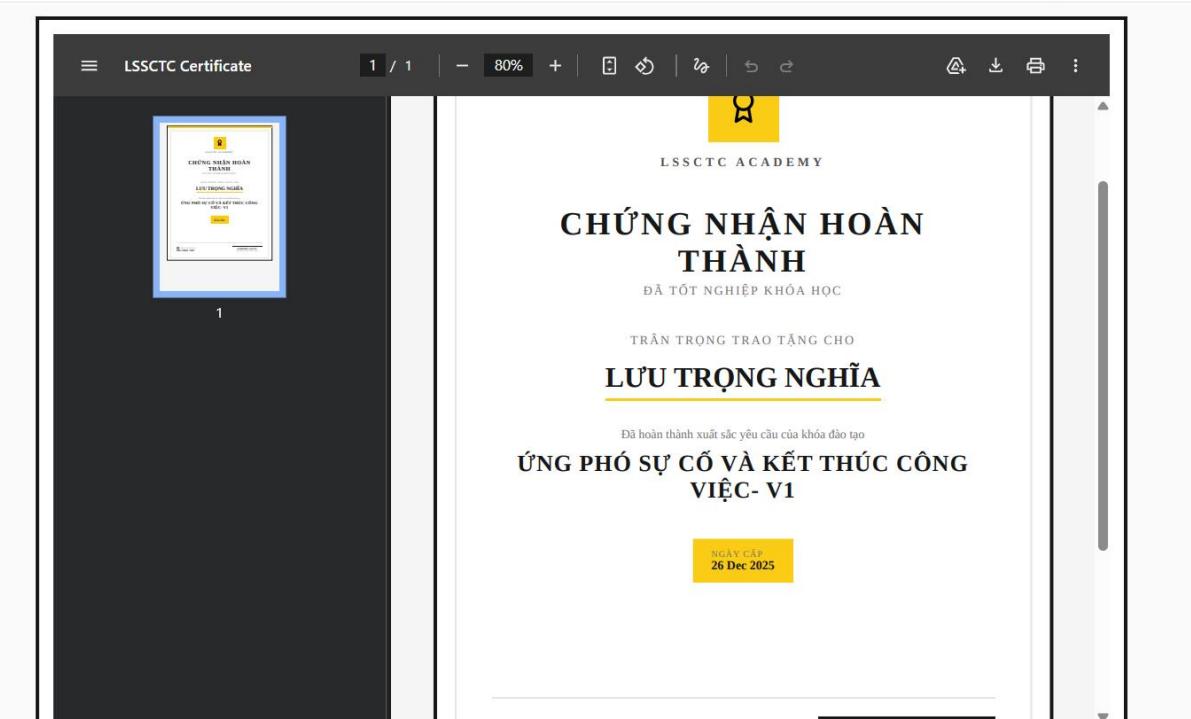


### 3. Download:

- Click the "Download" or "Tải PDF" button to retrieve the generated PDF certificate from the center.



- PDF format of the certificate should be opened on a new tab, and we can download it by clicking onto the download icon on the right side of task bar.



- For a different approach, we shall print the certificate directly instead of downloading it.

