

# **BRIDGE ENGINEERING COURSE WITH MIDAS CIVIL**

## **WHO IS THIS COURSE FOR?**

- ❖ Structural Engineers
- ❖ Civil Engineers with experience in structural designs
- ❖ Highway Engineers with experience on bridge design
- ❖ Final Year students in structural Engineering
- ❖ Final Year students in highway Engineering with interest in bridge design

## **HOW LONG IS THE COURSE?**

The course is delivered into three parts:

### **1. Indoor training**

Indoor training consists of the first step of this course. It will be taking 60 hours. Within this time schedule, the recap on bridge design theories that will be delivered along with the software application for good understanding of how bridge designs are done in engineering industry.

### **2. Project study**

After the aforementioned period training, the course participants will be given a realistic project study for the enhancement of what was taught during indoor training. The project will have to be completed and delivered within 3 months maximum. The delivery consists of presenting the completed project to the external board. During this period of project study, the course participant is not required to attend the class sessions; they only come for presentation of the progress once a week.

### **3. Expert Training Seminar**

This use to take one week - full time. It will be delivered by an expert imported from MIDAS or any other world renowned organization approved by MIDAS IT to verify, upskill and certify our trained engineers.

#### **COURSE OBJECTIVE:**

The main objective of this course is to deliver professional skills through a practical design of a real project.

The course will involve different practical exercises and assignments but the final goal is to deliver a technical design study of Highway Bridge project.

The MIDAS CIVIL will be used for 3D Modelling, analysis and design of the bridge structure. Entire work flow will be based on latest standard of Great Britain (BS5400-2) as well as ASHTTO ( LRFRD approach).

#### **WHO TEACHES THIS COURSE?**

The instructor of this course must be MIDAS approved professional. Find the appointed instructor(s) of this course by clicking the following link

<https://nzizatrainig.ac.rw/trainers/>

#### **WHAT WILL BE THE OUTCOME?**

At the end of this course training, you will have picked up the useful tips needed when utilizing MIDAS Civil, specific features within the software that help you complete your bridge design project with exact and effective construction documents for all concepts with standard bridge types.

## TRAINING COURSE CONTENT

**NOTE:** It can be updated anytime to match the market needs.

**Lesson 1:** Introduction to Basics of Bridge Design (understanding and terminology of bridge components, understanding the identification of traffic loads, identification of critical points for bridge elements design).

**Lesson 2:** New creation: How to create nodes and elements, how to model with spreadsheets, and how to quickly model a bridge.

**Lesson 3:** Project Inputs: How to model with cad files, how to use MCT command shell, practice text input with MCT command shell, how to check section offset, and how to check section calculations.

**Lesson 4:** Modifying/editing: How to update section properties quickly, how to change curvature quickly, how to modify load combinations, and how to review pile reaction in table format.

**Lesson 5:** Complete Steel Composite Bridge: Steel composite bridge modeling, analysis results, and design code checking.

**Lesson 6:** Concrete Bridge: T-Girder bridge with substructure

**Lesson 7:** Culvert Bridge Engineering: Introduction to culvert bridge, how to model, design and analyze a box culvert

**Lesson 8:** Cable Stayed Bridge: Introduction to Cable Bridge, cable force optimization

**Lesson 9:** Segmental Bridges: Introduction to segmental bridges

**Lesson 10:** Tunnel Modeling in the Structural Approach: 1D tunnel lining, 2D ground, 3D ground, tunnel wizard.

**Lesson 11:** Exploring Midas Civil: Graphic User Interface (GUI)

**Lesson 12:** Manual Modeling: Simple beam modeling, 2D frame modeling, 3D frame modeling, truss modeling, irregular structure plate modeling, and irregular modeling: skewed with 10th point, steel bent cap, post tensioned bent cap.

**Lesson 13:** Wizard Modeling: PSC transverse box

**Lesson 14:** Rail-Structure Interaction: RSI analysis using MIDAS per CHSRA requirements

**Lesson 15:** Soil-Structure Interaction: Substructure & foundation geometry modeling considering the superstructure approaches in defining boundary conditions.

**Lesson 16:** Seismic Analysis: Seismic analysis overview

**Lesson 17:** Live Load Analysis: Permit vehicle, live load optimization, centrifugal force, split bridge

**Lesson 18:** Design Code Checking: CHBDC CSA S6-14 for steel composite bridge.

**Lesson 19:** Get a final project to deliver.