COURSE OVERVIEW SE0036
Dynamic Analysis for Foundations & Steel Structure Under Vibrating Machines

Course Title
Dynamic Analysis for Foundations & Steel Structure Under Vibrating Machines

Course Reference
SE0036

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Date/Venue

Session(s)	Date	Venue
1	February 08-12, 2026	Pierre Lotti Meeting Room, Movenpick Hotel Istanbul Golden Horn, Istanbul, Turkey
2	August 09-13, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	November 22-26, 2026	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

In most industrial projects as petroleum industry in general and power generation and also refinery projects. There are many structures affecting by dynamic load due to machines. The design management procedure for industrial projects will be clarified. All the load that affects the structure building in oil and gas facilities will be illustrated.

The principal of dynamic analysis will be discussed in detail. This course will focus also about the design of steel structure withstand machines and design foundation under vibrating machines. The dynamic analysis techniques and piperack design against load shall be presented in addition to the most practical aspects for different international specification and standard.

This course is designed to provide participants with a detailed and up-to-date overview of dynamic analysis for foundations and steel structure under vibrating machines. It covers the fundamental of dynamic analysis; the design management process and controlling the design of the industrial projects; the load on the industrial structure; the dynamic loads behaviour and fundamental of dynamic analysis; the soil investigation, dynamic analysis methods, SDOF procedure and MDOF procedure; and the design of foundation under vibrating machine.

During this interactive course, participants will learn the interface between rotating equipment team and civil team; the design of steel deck under power turbine generator; the foundation design guideline; the examples of design foundation under gas compressor with power turbine and the design foundation under reciprocating machines; the pipe rack design, pipe rack configuration, loads on the piperack and design piperack under wind load; the interface between piping engineering and pipe rack; the dynamic analysis method; and the design procedure and structure natural frequency calculation.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on dynamic analysis for foundations and steel structure under vibrating machines
- Interpret concrete foundation design under vibrating machines and discuss the issues, standards and procedures used to design structures that dynamic loads
- Discuss the fundamental of dynamic analysis covering design management process and controlling the design of the industrial projects
- Define the load on the industrial structure as well as recognize the dynamic loads behaviour and fundamental of dynamic analysis
- Carryout soil investigation, dynamic analysis methods, SDOF procedure and MDOF procedure
- Illustrate the design of foundation under vibrating machine
- Describe the interface between rotating equipment team and civil team
- Design steel deck under power turbine generator and apply foundation design guideline
- Give various examples of design foundation under gas compressor with power turbine and the design foundation under reciprocating machines
- Illustrate pipe rack design, as well as pipe rack configuration, loads on the piperack and design piperack under wind load
- Discuss the interface between piping engineering and pipe rack and apply dynamic analysis method
- Employ design procedure and structure natural frequency calculation

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and consideration of dynamic analysis for foundations and steel structure under vibrating machines for civil and structural engineers.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Rashed Kaloop, PhD, MSc, BSc, is a **Senior Structural & Civil Engineer** with over **20 years** of extensive experience in **Blast Resistant Buildings**, **Seismic & Blast** Engineering, **Blast Loads** on **Buildings**, **Building Life Assessment**, **Blast Resistant Building** Design, Geographical Information System (**GIS**), **Mapping Information Management** Systems, **Survey Engineering** Applications, Global Positioning System (**GPS**), **AutoCAD Civil 3D**, Applied **Survey** Engineering, Plane Survey, Aerial & Terrestrial Photogrammetry, **Detailed Engineering Drawings**, **Codes** & **Standard**, **Surface Drainage Design** System, **Structural Reliability** Analysis, **Structural Design**, **Construction Materials**, **Structural** Monitoring, **Concrete Structures** Design & Maintenance, **Blast Resistant Risk Assessment & Mitigation**, **Performance of Bridges** under affected **Loads**, Monitoring the **Steel & Concrete Structures** under Blast Loads, **Steel Building Seismic** & **Blast Study**, **Seismic Evaluations**, **Structural** Health Monitoring, **Testing Equipment**, **Statistical** Application, Least Square Theory, **Geodesy** & **Geographical** Engineering and **Statistical** Analysis. Further he is well versed many engineering software's such as **GIS**, **Matlab**, Surfer, **CAD** and **Finite Element** Programs. He is currently the Manager of the GIS unit at the University of Mansoura wherein he is responsible in the public works, civil and structural engineering.

Dr. Kaloop is very active in academic activities for venturing respectable position as an Assistant Professor & Lecturer of different international universities. Further, he is a journal editor and reviewer of an international journal for structural engineering and mechanics as well as for information processing management and he has published 13 numerous papers mainly for Civil, Structural, Mechanics Engineering and Information Technology. He has further occupied key positions such as **Survey & Design Structure Engineer**, **Structure Design Engineer**, **Assistant Professor**, **Lecturer**, **Assistant Lecturer**, **Teaching Assistant** and **Senior Instructor/Trainer**.

Dr. Rashed has **PhD** in **Civil Engineering**, a **Master's** degree in **Public Works Engineering** and **Bachelor's** degree in **Civil Engineering** with **Honours**. Further, he is a **Certified Instructor/Trainer**, a member of the Engineering Syndicate of Egypt, published numerous papers and journals and delivered numerous trainings, workshops, seminars, courses and conferences internationally.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Fee

Istanbul	**US$ 6,000** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course Instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	*PRE-TEST*
0830 – 0930	***Fundamental of Dynamic Analysis***
0930 – 0945	*Break*
0945 - 1040	***Design Management Process***
1040 - 1230	***Control the Design of the Industrial Projects***
1230 - 1245	*Break*
1245 - 1420	***Define the Load On the Industrial Structure***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***The Dynamic Loads Behaviour***
0830 -0930	***Fundamental of Dynamic Analysis***
0930 - 0945	*Break*
0945 – 1030	***Soil Investigation***
1030 - 1230	***Dynamic Analysis Methods***

1230 – 1245	Break
1245 – 1420	**SDOF Procedure**
1420 – 1430	**Recap**
1430	Lunch & End of Day Two

Day 3

0730 – 0830	**MDOF Procedure**
0830 -0930	**Design of Foundation Under Vibrating Machine**
0930 - 0945	Break
0945 – 1030	**Interface Between Rotating Equipment Team & Civil Team**
1030 - 1230	**Design of Steel Deck Under Power Turbine Generator**
1230 – 1245	Break
1245 – 1420	**Foundation Design Guideline**
1420 – 1430	**Recap**
1430	Lunch & End of Day Three

Day 4

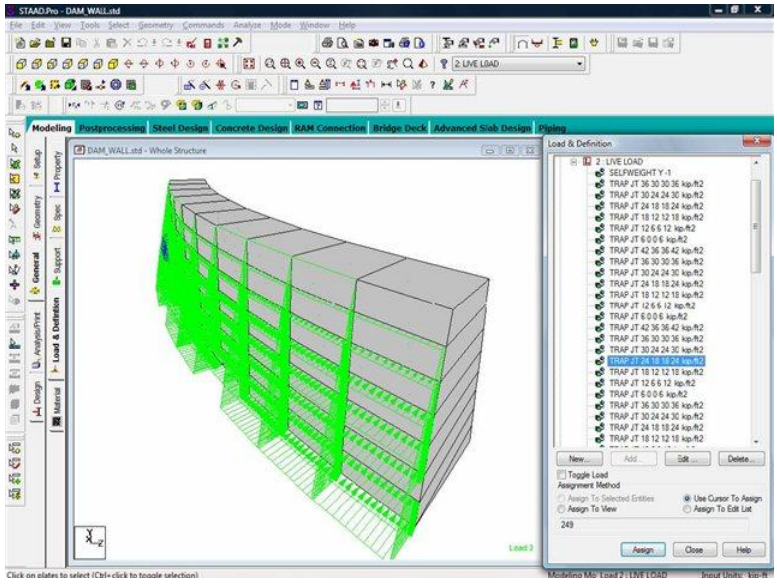
0730 – 0830	**Example of Design Foundation Under Gas Compressor with Power Turbine**
0830 -0930	**Example of Design Foundation Under Reciprocating Machines**
0930 - 0945	Break
0945 – 1030	**Case Study of Mitigation Solutions for High Vibration**
1030 - 1230	**Pipe Rack Design**
1230 – 1245	Break
1245 – 1420	**Pipe Rack Configuration • Loads on the Piperack**
1420 – 1430	**Recap**
1430	Lunch & End of Day Four

Day 5

0730 – 0830	**Design Piperack Under Wind Load**
0830 -0930	**Interface Between Piping Engineering & Pipe Rack**
0930 - 0945	Break
0945 – 1030	**Dynamic Analysis Method**
1030 - 1230	**Design Procedure**
1230 – 1245	Break
1245 - 1345	**Structure Natural Frequency Calculation**
1345 -1400	**Course Conclusion**
1400 – 1415	**POST-TEST**
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the “STAAD PRO” simulator.



STAAD-PRO SOFTWARE

Course Coordinator

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