COURSE OVERVIEW SE0402(GA2)
Advanced Seismic & Wind Design and Reinforced Concrete

Course Title
Advanced Seismic & Wind Design and Reinforced Concrete

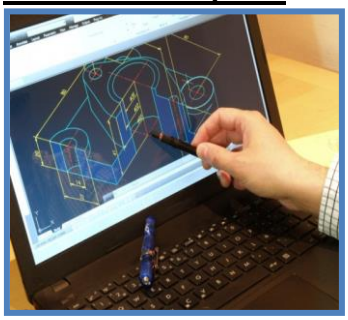
Course Reference
SE0402(GA2)

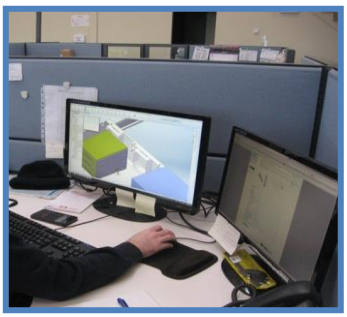
Course Duration/Credits
Five days/3.0 CEUs/30.0 PDHs

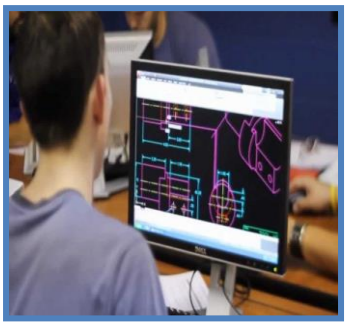
Course Date/Venue

Session(s)	Date	Venue
1	May 11-15, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 07-11, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 15-19, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	November 16-20, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

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.

This course is designed to provide delegates with a detailed and up-to-date overview of seismic and wind design and reinforced concrete in accordance with the latest version of American & British codes. It covers the wind forces, structural interaction and latest version of international codes and standard; the design for wind forces, code requirements and four different design techniques in accordance with the IBC, ASCE and British codes; the wind forces on structures; the design components and cladding in structures subjected to wind forces; the inputs and parameters for calculation of wind forces; and the design of structures for hurricane, tornadoes and special structures subjected to wind forces including free-standing board and tanks.

During this interactive course, participants will learn the effects of wind induced vibration on tall structures; the damping systems for tall structures; the seismic loading, horizontal distribution of seismic forces; the analysis and design of liquid retaining structures under seismic loading; the different structural systems and foundation types for withstanding the seismic effects; the risk and seismic effects in the buildings; the seismic load generation using STAAD or ETABS; the seismic and wind design and loading combinations as well as the detailing requirements of American and British codes; and the different structures and their behavior pertaining to seismic load as well as for the failure of some structure during seismic tremors.

Course Objectives

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

- Apply and gain an in-depth knowledge on analysis and design of buildings using ETABS
- Provide participants with an overall understanding of advanced seismic and wind design and detailing of reinforced concrete in accordance with ADIBC/ACI/ASCE and design the structures efficiently
- Discuss wind forces, structural interaction and latest version of international codes and standard as well as the design for wind forces, code requirements and present four different design techniques in accordance with the IBC, ASCE and British codes
- Calculate wind forces on structures as well as recognize the design components and cladding in structures subjected to wind forces
- Identify inputs and parameters for calculation of wind forces
- Illustrate the design of structures for hurricane, tornadoes and special structures subjected to wind forces including free-standing board and tanks
- Describe wind induced vibration and its effects on tall structures as well as damping systems for tall structures
- Carryout seismic loading, horizontal distribution of seismic forces and analysis and design of liquid retaining structures under seismic loading
- Compare the different structural systems and foundation types for withstanding the seismic effects
- Evaluate risk and mitigate seismic effects in the buildings and describe seismic load generation using STAAD or ETABS
- Illustrate seismic and wind design and loading combinations as well as compare detailing requirements of American and British codes
- Analyze different structures and their behavior pertaining to seismic load as well as for the failure of some structure during seismic tremors

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 is intended for senior civil and structural engineers who need to learn how to apply the IBC, ASCE and British codes for seismic and wind provisions to the design detailing of reinforced concrete buildings and who need more in-depth knowledge and skills. Educators, code enforcement personnel and the plan check community will also benefit from attending the course. Further, the course is also beneficial for AGP Managers/Engineers/Specialist/other professionals who are responsible for their function or subject area.

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

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**. 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 Fee

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.

Accommodation

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

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:

Professor Engin Aktas, PhD, MSc, BSc, is an **international expert** with over **25 years** of extensive experience in **Structural Reliability**, **Earthquake Engineering**, **Design of Concrete and Steel Structures**, **Structural Damage Assessment & Safety Evaluation** and **Structural Health Monitoring**. He has been a **Senior Professor** to all personnel ranging from students to post graduate students at universities and industrial clients. He has been teaching in the areas of **Theory of Matrix Structural Analysis**, **Engineering Mechanics**, **Mechanics of Materials**, **Civil Engineering System Analysis**, **Statistics for Civil Engineers**, **Structural Dynamics**, **Operations Research**, **Structural Optimization**, **Design of Reinforced Concrete Structures**, **Design of Steel Structures and Structural Reliability**.

During his career life, Professor Aktas performed the design, construction and installation of numerous buildings and industrial structures. Previously, he was the **Structural Design Engineer** with an international company handling multi-million design projects. He is renowned for his enthusiasm and tremendous instructing skills. Moreover, he had been a **Post-Doctoral Fellow** of **NRL/ASEE** and the recipient of the **Naval Research Laboratory/American Society for Engineering Education Fellowship** for his dedication and contributions to his field and was engaged with the **US Naval Research** for a project on "**Damage Detection on Composite Wing of Unmanned Air Vehicle using FBG sensors**".

Professor Aktas has **PhD** and **Master** degrees in **Civil Engineering** from the **University of Pittsburgh** (**USA**) and **Bachelor** degree in **Civil Engineering** from **Middle East Technical University** (**Turkey**). Further, he had served as a **Post-Doctorate** in **US Naval Research Laboratory** (**ASEE/NRL Fellow**) in **Washington DC**, **USA**. Moreover, he is a **Certified Instructor/Trainer** and a well-respected member of the **Union of Chambers of Engineers and Architects of Turkey**, the **Earthquake Engineering Association of Turkey** and the **International Association for Bridge Maintenance and Safety** (**IABMAS**).

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	***Introduction to Wind Forces, Structural Interaction & Case Studies as per the Latest Version of International Codes & Standards*** *IBC ● ASCE ● British Codes*
0930 - 0945	*Break*
0945 – 1040	***Design for Wind Forces, Codes Requirements & Presentation of the Four Differed Design Techniques*** *IBC ● ASCE ● British Codes*
1040 – 1135	***Four Story Detailed Example***
1135 – 1230	***Calculating Wind Forces on Structures***
1230 – 1245	*Break*
1245 – 1315	***Wind Loads Calculations using ASCE7-10***
1315 – 1345	***Examples***
1345 - 1420	***Case Studies of Wind Damage***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Design for Components & Cladding in Structures Subjected to Wind Forces***
0930 – 0945	*Break*
0945 – 1015	***Inputs/Parameters for Calculation of Wind Forces***
1015 – 1045	***Design of Structures for Hurricanes & Tornadoes*** *Procedures (Simplified & Analytical) for Wind Calculation with Worked out Example*
1045 – 1115	***Design of Special Structures Subjected to Wind Forces Including Free-Standing Board & Tanks***
1115 – 1230	***Wind Induced Vibration & its Effect on Tall Structures (Stack/Chimney, Building, Etc.)*** *Application of Related Software including STAAD Pro and ETABS*
1230 – 1245	*Break*
1245 – 1335	***Damping Systems for Tall Structures (Tuned Mass Dampers)***
1335 – 1420	***Introduction to Seismic Loading***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Seismic Loads as per ADIBC***
0930 – 0945	*Break*
0945 – 1015	***Structural Systems***
1015 – 1045	***Site Class & Soil Parameters***
1045 – 1115	***Seismic Design Category***

1115 - 1230	***Horizontal Distribution of Seismic Forces***
1230 – 1245	*Break*
1245 - 1335	***Distribution of Seismic Base Shear Over the Height of the Building Seismic Analysis of Tanks Foundations with Worked Out Example***
1335 – 1420	***Base Shear Calculations***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

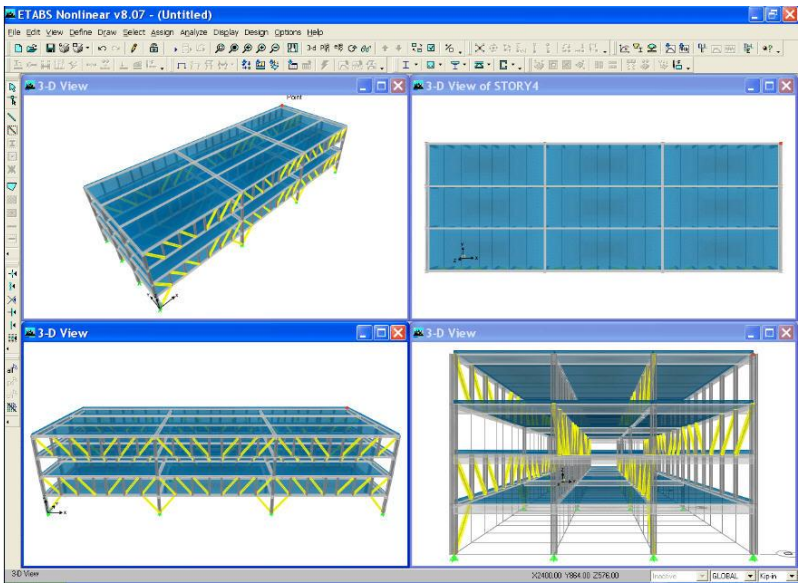
0730 – 0930	***Analysis & Design of Liquid Retaining Structures Under Seismic Loading (Including Sloshing)***
0930 – 0945	*Break*
0945 – 1015	***Comparison between the Different Structural Systems & Foundation Types for Withstanding the Seismic Effects***
1015 – 1045	***Risk Evaluation & Mitigation of Seismic Effects in the Buildings (Not Designed for Seismic) with Case Studies***
1045 – 1115	***Load Combinations Involving Wind/ Seismic Loads***
1115 – 1230	***Seismic Load Generation in Software (STAAD, ETABS, etc) with Examples***
1230 – 1245	*Break*
1245 - 1335	***3D Building Analysis & Design using STAAD***
1335 – 1420	***Frequency mode shape in STAAD***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Structural Modelling***
0930 – 0945	*Break*
0945 – 1015	***RC Building Design-Example***
1015 – 1045	***RC Detailing Requirements as per Codes***
1045 – 1115	***Seismic & Wind Design & Load Combinations*** *Special Detailing Requirements for Reinforced Concrete Elements & Structural Steel Elements with Diagrams/Sketches*
1115 – 1230	***Comparison of Detailing Requirements Between American & British Codes***
1230 – 1245	*Break*
1245 - 1345	***Case Studies*** *Analysis of Different Structures Demonstrating their Behavior under the Seismic Loadings as well as for the Failure of Some Structure during Seismic Tremors*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1450	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulators (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 "ETABS" simulator.



ETABS Software

Course Coordinator

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