

## Short Technology Course on **Verification, Validation and Updating of FE Models for Structural Analysis (VVU-191)**

### Date and Location

March 13-15, 2019

Novotel Leuven  
Vuurkruisenlaan 4,  
3000 Leuven, Belgium.

### Course Language

The course language is English.

### Presenter

Ir. Eddy Dascotte, *DDS NV*

### Course Fee

€ 950 euro per person.

This fee includes course materials, lunches and refreshments.

### Registration

Advance registration is required. To register, please complete the attached form and return by fax or use the online registration form at <http://www.femtools.com/courses>.

Upon registration you will receive an email confirmation of your reservation with additional practical information about the venue and course.

### Cancellation Policy

A full refund will be made for all cancellations received 8 days before the start of the course. Afterwards 50% of the costs will be charged.

Substitute attendees will be accepted at any time.

In the event that we have to cancel the course, course fees will be refunded in full but we disclaim any further liability.

### Additional Information

<http://www.femtools.com/courses>  
[info@femtools.com](mailto:info@femtools.com)  
+32 16 40 23 00

### Overview

Engineering simulation has become an essential tool for supporting decision-making in product design, qualification and certification. To guarantee the required confidence in results obtained with technologies like finite element analysis, these simulation models must be assessed for their predictive capabilities. Engineers are facing new responsibilities and challenges to comply with new Quality Assurance standards like ASME or ISO 9001 that specify more stringent requirements to demonstrate validity of simulation engineering. This requires the adoption of new workflows for Verification and Validation (V&V) using physical tests or high fidelity models, and in most cases, the updating of input parameters. Today this workflow can be largely automated thanks to integrated software tools. These tools, that rely on the combined use of simulation and test data, can also be used in the framework of the Digital Twin concept and enable applications like Structural Health Monitoring (SHM).

During this technology course, all aspects of a V&V and model updating process for structural static and dynamic analysis will be reviewed. Complementary technologies and applications like probabilistic analysis, pretest planning, structural modifications, force identification and material characterization will also be discussed and demonstrated.

Participants are also given an opportunity to get hands-on experience using a specialized software package (FEMtools Model Updating) that will be used for exercises during approximately half of the time.

### Intended Audience

This course is suitable for anyone interested in learning the state-of-the-art in finite element model verification, validation and updating. Participants typically have a background in CAE, simulation quality assurance, structural dynamics, modal testing, or noise and vibration troubleshooting. The methods shown can, however, be applied to a wide range of industrial applications.

### Course Contents

- Overview of model verification, validation and updating for structural analysis
- Database management and interfacing with commercial finite element software and test data
- Using internal and external finite element solvers for re-analysis
- FE-test correlation analysis
- Modal pretest analysis
- Sensitivity analysis
- Model updating using static test data
- Modal-based model updating
- FRF- and ODS-based model updating
- Advanced model updating concepts (multi-model updating, parameter relations, superelements,...)
- Probabilistic model validation and updating
- Applications of model updating (material identification, SHM,...)
- Using condensed models for fast re-analysis
- Force identification and updating
- Using scripting for database management, analysis integration and automation

## Course Registration Form

**Participant(s):**

Name(s) .....

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Company .....

Address .....

.....

E-mail .....

Telephone ..... Fax .....

Date ..... Signature .....

**Invoice Address:**

Company .....

Invoice Address .....

.....

**VAT Number:** .....

**I hereby register for the following course:**

VVU191 – Verification, Validation and Updating of FE Models (March 13-15, 2019) – 950 euro

**Course Fee:** Fees will be charged by invoice\* and include course materials, lunches and refreshments.

**Cancellation Conditions:** A full refund will be made for all cancellations received 8 days before the start of the course. Afterwards 50% of the costs will be charged. Substitute attendees will be accepted at any time. In the event that we have to cancel the course, paid course fees will be refunded in full but we disclaim any further liability.

\*VAT exempt following article 44 of the EU Council Directive 2006/112/EG. Reverse charge. For invoices to Belgian and non-EU companies, 21% VAT will be added. VAT rules can be subject to change.

Use <https://www.femtools.com/courses/registration.php> to register online,  
or complete and fax this form to +32 16 40 24 00 or email to [info@femtools.com](mailto:info@femtools.com)

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