ITTcert BY ORSYS

Course : SolidWorks - Simulation Calculation Advanced

Official Dassault Systèmes course, SolidWorks exam preparation

Practical course - 2d - 14h00 - Ref. SWV

★★★★⯪   **4,4 / 5**

This course enables you to deepen your skills in advanced analysis to optimize the design of parts and assemblies. It covers key areas such as frequency analysis, buckling, fatigue, thermal analysis and impact testing, helping to anticipate mechanical stresses and improve product reliability. You'll learn how to optimize part topology to reduce weight while maintaining performance. This course is designed to help you master simulation tools and understand the physical phenomena that influence design.

🎯 Teaching objectives

At the end of the training, the participant will be able to:

- ✔ Perform structural and thermal analyses in SolidWorks Simulation
- ✔ Analyze and optimize the structural behavior of SolidWorks models
- ✔ Master frequency analysis, drop testing and optimization

Intended audience
Design office technicians, draftsmen, engineers. Anyone with experience of 3D design software.

Prerequisites
Avoir suivi la formation « SolidWorks Simulation Calcul Base » (Réf. SWU) ou avoir des connaissances équivalentes.

Certification
This training course provides the foundations needed for CSWP-Simulation certification, although it is not specifically dedicated to the exam.
Comment passer votre examen ?

PARTICIPANTS
Design office technicians, draftsmen, engineers. Anyone with experience of 3D design software.

PREREQUISITES
Avoir suivi la formation « SolidWorks Simulation Calcul Base » (Réf. SWU) ou avoir des connaissances équivalentes.

TRAINER QUALIFICATIONS
The experts who lead the training courses are specialists in the subjects covered. They are approved by the publisher and certified for the course. They have also been validated by our teaching teams in terms of both professional knowledge and teaching skills for each course they teach. They have at least three to ten years of experience in their field and hold or have held positions of responsibility in companies.

Practical details

Teaching methods

Training in French. Official course material in digital format and in English. Good understanding of written English.

Course schedule

(1) **Frequency analysis of parts**

- Principle of modal analysis.
- Analyse fréquentielle avec déplacements imposés.
- Frequency analysis without imposed displacement.
- Frequency analysis with loading.

Hands-on work
Case study: diapason

(2) **Frequency analysis of assemblies**

- Contact management.

Hands-on work
Case study: engine mount

(3) **Buckling analysis**

- Linear buckling analysis.
- Buckling safety factors to assess the stability of our design.

Hands-on work
Case study: particle separator

(4) **Load case management in simulation**

- Load cases.
- Use the load case manager tool to combine loads.

Hands-on work
Case study: scaffolding

(5) **Under modeling**

- Under modeling.
- Parent study (study on an isolated part of the scaffolding).
- Child study (study on an isolated part of the scaffolding).

Hands-on work
Case study: scaffolding

(6) Topology analysis

- Topology analysis.
- Definition of optimization limits and objectives.
- Application of manufacturing control to design.

Hands-on work
Case study: mechanical linkage of a bicycle rear shock absorber

(7) General thermal analysis

- Thin components.
- Fundamentals of thermal analysis.
- Steady-state thermal analysis.
- Transient thermal analysis.
- Transient analysis with time-varying loading.
- Transient thermal analysis using a thermostat.

Hands-on work
Case study: chip assembly

(8) Thermal analysis with radiation

- Steady-state analysis with radiation.

Hands-on work
Case study: spotlight assembly

(9) Advanced thermal stresses-2D simulation

- Thermal stress analysis.
- Thermal analysis with 2D simplification.
- Thermal stress analysis.
- Comparison with a 3D approach.

Hands-on work
Case study: metal expansion joint

(10) Fatigue analysis

- Review of fatigue (stages of fatigue failure, cycle fatigue, high-low).
- Fatigue based on life-stress (S-N).
- Thermal study.
- Thermal stress study.
- Fatigue terminology.
- Fatigue study.
- Fatigue study with permanent loading.

Case study

(11) Variable amplitude fatigue

- Variable amplitude fatigue study.

Hands-on work
Case study: suspension

(12) Drop and impact test simulation

- Drop test analysis.
- Rigid floor drop test.
- Fall test on elastic floor.
- Drop test with elastoplastic material model.
- Drop test with contact interaction.

Hands-on work
Case study: camera

(13) Optimization analysis

- Optimization analysis.
- Static and frequency analysis before optimization.
- Optimization analysis.
- Design study.

Hands-on work
Case study: press frame.

(14) Pressure vessel analysis

- Analysis of a pressurized container.
- Flange and cover for manhole nozzle.

Hands-on work
Case study: pressurized tank