Introduction to FEM analysis with CivilFEM for ANSYS

1. Program overview

Title: Introduction to FEM analysis with CivilFEM for ANSYS – online course.

Director: Professor Juan José Benito Muñoz.

Department: Construction & Manufacturing Engineering (UNED University).

2. Eligibility and requirements

A degree is required, although university students in the last year of their course may be admitted with proof of their academic status.

3. Goals

The objective of this course is to introduce attendees to the use of *Finite Element* analysis software, allowing them to acquire the basic skills to enable them to use this type of analysis in their professional practice.

This course originated as a collaboration project between UNED and Ingeciber, S.A., a company specializing in Computer-Aided Engineering (CAE).

4. Contents

The course consists of three subjects, including an introduction to ANSYS software, which is used for geometry modeling, meshing and solving:

    a. Introduction to the use of the application software I

    b. Introduction to the use of the application software II

    c. Practical Application Exercises with CivilFEM for ANSYS

The content of each subject is detailed below:

- **Introduction to the use of practical software I**

1. Overview

2. Introduction to the Finite Element Method

3. CivilFEM & ANSYS Graphical User Interface

4. Setup data

5. Geometry modeling

6. Materials

7. Sections

8. Meshing

- **Introduction to the use of practical software II**

1. Loading

2. Solution

3. Post-processing results

4. Utilities

- **Practical application exercises with CivilFEM for ANSYS**

The proposed exercises give a general overview of the field of Civil Engineering.

The exercises represent a review of the concepts introduced in the subjects taken until now, as well as the orderly use of the CivilFEM for ANSYS.

These exercises will be delivered to the tutor in order to get feedback and recommendations.

The exercises will be similar to the following ones:

1. Geometry & meshing exercises

2. Beam analysis

3. Cantilever plate

4. Bridge truss

5. Circular concrete Slab

6. Plane truss

7. Warehouse

8. Dam analysis

9. Linear buckling of a column

10. Analysis of a frame

11. Linear springs

12. Silo

13. Pile cap foundation

14. Tunnel cut & cover

5. Schedule

50 hours of study. The course lasts from 1 to 6 weeks with full flexibility since no specific delivery date is indicated.

Distance evaluation tests: Attendees must deliver three of the practical exercises proposed in the practical course subject.

6. Methodology

Distance learning methodology, including pre-prepared study materials and bibliography, tutorials, audiovisual resources, distance evaluation tests (mainly practical exercises using the computer) and evaluation exams.

7. Teaching materials

Attendees will receive the teaching guide and the corresponding materials for each module, which will basically consist of the subject texts.

Furthermore, in order to complete the practical exercises and training, the educational version of CivilFEM for ANSYS will be provided by the course.

The course uses a virtual classroom as a training facility where study tools can be found, and also as the main communication channel with the attendees.

Other tools will also be used including audiovisual resources as well as other complementary documentation.

8. Attendee services

The teaching staff will respond to attendee inquiries via telephone, email, or in person. Phone tutorships will be available within the following hours:

Monday to Friday during office hours and always subject to tutor's availability.

9. Evaluation and grading criteria

Attendee evaluation will be performed through the Practical Application Exercises.

10. Certification

Certification will consist of a diploma from ICAEEC & Ingeciber indicating successful completion of the subject by the attendee as well as the grade obtained in the corresponding evaluation exams.

11. Teaching staff

Professor Juan José Benito Muñoz (director). Construction & Manufacturing Engineering Department (UNED).

Mr. Ronald Siat (tutor & coordinator). Ingeciber S.A.

Mr. Román Martín (tutor). Ingeciber, S.A.

12. Fees

Tuition fees are 450,00 €.

Current and former attendees of the UNED *Master's in Theoretical and Practical Application of the Finite Element Method and CAE Simulation* are eligible for a 33% discount.

13. Validation

Attendees who pass this course can request validation of the application and practical course subjects of the construction branch of the CivilFEM for ANSYS expert module from the academic board of UNED *Master's in Theoretical and Practical Application of the Finite Element Method and CAE Simulation*.