SUMMER SCHOOL 2019
9 – 20 SEPTEMBER 2019, Granada, Spain

UNIVERSIDAD DE GRANADA

Escuela Internacional de Posgrado

DYNASTEE

DMBEA 2019

International Doctoral Summer School
University of Granada

Dynamic **M**ethods for whole **B**uilding **E**nergy **A**ssessment

Introduction

After 7 very successful editions of the Summer School on *"Dynamic methods for whole building energy assessment"* the organisers have decided to offer a two-weeks doctoral course that focuses more on pragmatic application of dynamic calculation techniques, meaning that the analysis of building energy data is of high importance and can give potentially high value information to utility and end-user. The focus will be on increased complexity, presenting different approaches and application to benchmark data.

Careful examination of energy consumption in the building sector, which is about 39% of the final energy consumption in EU-28 is needed in order to identify the specific areas for energy savings. Due to improved insulation levels of buildings this saving potential moves to more dynamic energy use sectors such as gains from appliances, high energy demand and consumer behaviour. Today, more and more data related to building and building components originate from outdoor testing under time-varying and dynamic conditions, or from real life use of buildings. Dynamic evaluation methods are techniques to analyze time series of data related to dynamic processes and to identify typical parameters of the physical processes for evaluation.

More information about the lectures can be found in the document; *About the Course*. Among topics that will presented during the two-weeks long Summer School, Level 1 and 2 will be:
· Data; first steps for evaluation by plots, graphical examination, common sense, average method and final data selection
· Correlation and statistics from the available data for model development
· Dynamic versus static analysis and physical versus statistical perspective
· General regression techniques
· Methods and models; Output error (OEM) and Prediction error (PEM) methods
· Residual analysis and feedback for model development
· LORD tool, MatLab and R-routines in the R-environment
· Continous Time stochastic modelling using CTSM-R

- · Benchmark data-series; from simulated data for conductive heat transfer to real data for dynamic features of heat transfer
- · CEN-ISO standards for heat transfer assessment

This summer school comprises 60 hours of doctoral training activities each week (30 hours each level). The cost for the two-weeks Summer School is **475** Euro[1]. In case that the participant decides to follow the course for one week, either Level 1 or Level 2, the cost is **290** Euro. This covers:
- Handout of lecture notes and relevant papers
- Lunches - Coffee breaks (during lecture period)
- Social event and dinner on Wednesday

Registration - The deadline for submission is 15th July 2019.
For registration and communication with the students, download and upload of documents, etc. the organisers are using the services of the CIEMAT - PSA.
Potential participants are requested to do a **pre-registration** by sending a notification to info@dynastee.info or to Marta Ruiz, e-mail: mruiz.serviciosexternos@psa.es

For further information follow the DYNASTEE web-site; www.dynastee.info or http://sl.ugr.es/dmbea2019
Upon pre-registration further information about accommodation and payment procedure of the participation fee, will be sent.

Preliminary programme.
The daily programme is organised around lectures and exercises each morning and afternoon session. Each week-long programme offers >10 one-hour lectures and as much time for exercises as possible which means roughly 50% of the time to apply your skill to data analysis. The first day is focused on the obligatory homework (see *About the Course.pdf*) that should be presented by each participant, highlighting the solutions and problems in the approach of solving the wall exercise.

Date: 9 - 20 September 2019 Granada, Spain

Language: All lectures and documentation are in English.

Organised in collaboration by: Doctorate School on Sciences, Technologies and Engineering from the University of Granada (UGR), International postgraduate school UGR (Escuela internacional de posgrado, EIP UGR), CIEMAT (Spain) and DYNASTEE-INIVE.

Venue: The Summer School will take place at the University of Granada, Spain.
Granada can be reached in different ways. The most common travelling option is to fly to Malaga and then take a bus to Granada. Some direct flights to Granada exist.

[1] Participants from the INIVE registered members receive 50% discount