



1. Course number and name

RB-S1-19-S74-D8, **Advanced Computer Science Tools in Civil Engineering**

2. Credits and contact hours*

2 ECTS, lectures: 30 hours**

3. Instructor's or course coordinator's name

Ryszard Walentyński PhD, DSc/University Professor

4. Text book, title, author, and year

S. Rajasekaran: „Structural Dynamics and Earthquake Engineering; Theory and Application using Mathematica and Matlab”. CRC Press 2009

M. Asghar Bhatti: „Fundamental Finite Element Analysis and applications with Mathematica and Matlab Computations”. Wiley 2005

F. Mittelbach et al. : „The LaTeX Companion”. Addison-Wesley 2004

a. other supplemental materials

M. Asghar Bhatti: „Advanced Finite Element Analysis and applications with Mathematica and Matlab Computations”. Wiley 2005

A.L. Tyree: „Self-publishing with LyX”. Sage Tutorial Systems 2007

5. Specific course information

a. brief description of the content of the course (catalog description)

Lectures:

Basis of computer algebra systems- CAS (Mathematica, Derive, Maple, Wolfram|Alpha etc.). Applications of CAS in civil and structural engineering. High level systems for dealing with numerical tasks (Matlab, Scilab, GNU Octave). Advanced software for scientific and engineering documents edition (LaTeX, LyX, TeXmacs, TeXnic Center, etc.).

b. prerequisites or co-requisites

None

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

Elective

6. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic



Knowledge about modern design, computational and editorial computer aided tools

Basic skills in application of advanced computer aided tools of computation and edition.

Autonomically complements and extends knowledge of modern technologies.

Is aware of the need to raise their professional and personal competencies

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

K1A_W04, K1A_U14

7. Brief list of topics to be covered

1. Advanced software for scientific and engineering documents edition (LaTeX, LyX, TeXmacs, TeXnic Center, etc.)
2. Computer algebra systems- CAS (Mathematica, Derive, Maple, WolframAlpha etc.). Applications of CAS in civil and structural engineering.
3. High level systems for dealing with numerical tasks (Matlab, Scilab, GNU Octave).

*- Consultations were not included in the contact hours

** -per semester