Advanced Mathematics
2nd course Engineering Informatics

October 1, 2015

General Information

Lecturer: Gerardo Oleaga, Department of Applied Mathematics, Faculty of Mathematics.
Email: goleaga@ucm.es
Room 302-D (Mathematics). Room 232 (Informatics).
Office hours: Monday, Wednesday and Thursday 10:00 -12:00 hs. Please notice that it is always better to contact me by email to fix a date for office lectures.

Classes: Monday, Wednesday, Thursday 12 hs, and Friday 11 hs, Room 7 Faculty of Informatics.
On Fridays I will check attendance and we will have extra activities (written exercises, computer examples). The students who attend not less than 80% on friday classes and complete the assignments will get a point in the final grade.

Contents

The subject is divided in two quite different parts: Calculus and Algebra.

Calculus

Uniform and pointwise convergence of functions. Differential equations. Laplace and Fourier transform.
Applications: Signal Processing, Electric Circuit Analysis.

Algebra

Integers. Groups. Rings, Polynomials and Finite Fields.
Applications: Cryptography, Encoding.

Course Grading

The final grade is computed summing the result of the final exam (90%) plus the point obtained by the attendance record to friday classes.

References

[1] *Applied Mathematics: Body & Soul*. Kenneth Eriksson, Don Estep and Claes Johnson, Vol 1. Freely availabel in the web: http://www.csc.kth.se/~cgjoh/eriksson-vol1.pdf

[2] *Introduction to Real Analysis,* Robert G. Bartle and Donald Sherbert. John Wiley & Sons, Inc. 2011 (4th edition).

[3] *Partial Differential Equations of Mathematical Physics and Integral Equations*, Ronald Guenther and John Lee. Prentice Hall 1988.

[4] *A first course in differential equations*, Frank G. Hagin. Prentice Hall 1975.

[5] *Algebra for Computer Science*, Lars Gårding, Torbjörn Tambour. Universitext, Springer 1988.

[6] *Abstract Algebra: Theory and Applications,* Thomas Judson. Free download: http://abstract.ups.edu/download/aata-20140815.pdf.

[7] *Applied Abstract Algebra*, Rudolf Lidl & Günter Pilz. Springer 1998 (Second edition).

[8] *Abstract Algebra*, John Beachy & William D. Blair. Waveland Press 2006 (Third edition).