

Analyse II

Lecturers

Jérémie ROLAND (Coordinator) and Thomas LESSINNES

Course mnemonic

MATH-H2000

ECTS credits

8 credits

Language(s) of instruction

French

Course period

First and second terms

Campus

Solbosch

Course content

Series of real and complex numbers, sequences and series of functions; pointwise convergence, uniform convergence and convergence in the mean-square sense. Power series, Fourier series. Generalized integrals and derivation of functions defined by integrals. Linear differential equations: initial value problems, boundary value problems, Sturm-Liouville problems, Green's function. Second order linear partial differential equations: characteristic curves and Cauchy-Kovaleska problem, well-posed problems, wave equation, heat equation, Laplace and Poisson equations.

Objectives (and/or specific learning outcomes)

Study the basic concepts and tools of real analysis necessary for the engineering sciences in general, as well as developing the ability to go further in mathematics when needed.

Pre-requisites and co-requisites

Co-requisites courses

MATH-H1001 | Eléments d'algèbre et d'analyse | 5 crédits and
TRAN-H100 | Introduction aux sciences appliquées | 8 crédits

Courses having this one as pre-requisit

CHIM-H314 | Introduction au génie des procédés | 5 crédits and
MATH-H304 | Automatique | 5 crédits

Courses having this one as co-requisit

MATH-H3001 | Signaux et systèmes | 5 crédits and
PHYS-H200 | Physique quantique et statistique | 5 crédits

Teaching method and learning activities

Lectures and supervised exercises.

Contribution to the teaching profile

Solve complex scientific problems

References, bibliography and recommended reading

- > T. Tao: Analysis II, Hindustan Book Agency, India, 2006.
- > W.E. Boyce and R.C. Di Prima: Elementary differential equations and boundary value problems, Wiley, New York, 1991.
- > G.F. Simmons: Differential equations with applications and historical notes, McGraw-Hill, 2017.
- > W.A. Strauss: Partial differential equations, Wiley, New York, 1992.

Course notes

Syllabus and Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

Prof. (Analyse 2A): Thomas Lessinnes :
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Prof. (Analyse 2B): Jérémie Roland: Jeremie.Roland@ulb.be

Evaluation method(s)

written examination

Evaluation method(s) (additional information)

A written examination in January (Analyse 2A) and another written examination in May or June (Analyse 2B), both on both theory and exercises. Open questions are asked where the ability of applying the notions and theorems in a slightly different framework is tested, together with the ability to elaborate and write down careful proofs.

Two second session written examinations in August following the same modalities as a first session (one written exam for each part, with possible exemption of one of the exams in case of a grade higher or equal to 10/20 for the corresponding part).

Determination of the mark (including the weighting of partial marks)

The arithmetic mean of the grades for the examinations of Analyse 2A and Analyse 2B, rounded to the nearest half-integer.

If the credits of the course are not acquired after a given evaluation session, any partial grade (Analyse 2A or Analyse 2B) that is higher or equal to 10/20 will be automatically transferred to the next session. In no circumstances will a grade strictly lower than 10/20 be transferred to another session.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the Brussels School of Engineering

BA-IRCI | Bachelor in Engineering Sciences | option Bruxelles/unit 2

