



Programme of Module "Advanced Analysis 2"

- Code: DT0115
- Type of course unit: Compulsory (Master Degree in Mathematics curriculum Generale)
- Level of course unit: Postgraduate Degrees
- Semester: 2

Number of ects credits: (Master Degree in Mathematics) 6 (workload 150 hours)

Teachers: Stefano Spirito (stefano.spirito@univaq.it)

1	Course objectives	Aim of the course is the knowledge of advanced techniques of mathematical analysis and in particular the basic techniques of the modern theory of the partial differential equations.
2	Course content and learning outcomes (dublin descriptors)	<p>Topics of the module include:</p> <ul style="list-style-type: none"> • Abstract Measure theory • AC and BV functions. • Second order elliptic equations. • Variational methods. • Fourier transforms. <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> • Aim of the course is to acquire Knowledge and Understanding of Advanced Techniques of 'Mathematical Analysis. • applying the techniques learned to problems of partial differential equations • Acquire the ability to understand what methods and techniques can be used in various problems involving the partial differential equations. • Acquire the ability 'to expose, explain and elaborate concepts and advanced analysis techniques. • Acquire the ability 'to study and understand theorems and analysis techniques from books and advanced research products.
3	Course prerequisites	A good knowledge of the basic arguments of a course of Functional Analysis, in particular, a good knowledge of the theory of Lebesgue's integral and the L^p spaces. The first module of the course, in particular a good knowledge of the theory of distributions and Sobolev spaces.
4	Teaching methods and language	<p>Lectures.</p> <p>Language: English</p> <p>Reference textbooks</p> <ul style="list-style-type: none"> • L. Grafakos, <i>Classical Fourier Analysis</i> . • P. Cannarsa and T. D'aprile, <i>Introduction to Measure Theory and Functional Analysis</i> . • L. Evans and R. Gariepy, <i>Measure Theory and Fine Properties of Functions (Revised Edition)</i>. • L.C. Evans, <i>Partial differential equations</i>.
5	Assessment methods	Written exams.