Didactic activity

Her didactic activity (at the Faculty of Engineering of Università degli Studi Federico II from 1990 to 2000 and , from 2000 to date at the Faculty of Engineering of the Seconda Università degli Studi di Napoli) consisted in lectures and lessons in the following subjects : Mathematical Analysis I, Mathematical Analysis II and Mathematical Analysis for the Master's Degree course, Mathematical Methods for Engineering and Mathematics 4. The activities have been complemented by a full schedule of relevant tutorials.

Scientific activity.

She started her research activity with the study of Abstract Differential Equations, Elliptic Variational Inequalities and Variational Evolution Inequalities. The results obtained pertain to well know difficult questions of existence, uniqueness and regularity of the solution which are answered by employing sophisticated analytical instruments.

Special attention was devoted to certain themes connected to Engineering studies and therefore some of the problems tackled originated from issues related to unilateral elasto-dynamics which correspond to typical structural models in Civil Engineering and to certain classes of composite polymeric materials. The difficulties encountered in this field of research on such empirical phenomena are mostly due to the fact that the variational problems to be solved are not adequately supported by the existing theory ; in fact the coerciveness of the operators on which it is based very often does not characterize the empirical phenomena.

Later she focussed her attention on questions concerning the existence of multiple solutions and positive solutions of elliptic equations with non linear Newman boundary conditions and of systems of non linear elliptic equations with homogeneous Dirichlet boundary conditions.

Non linear boundary problems have been of interest for some time and have been tackled in different ways by employing compactness and monotony techniques and over and under solutions. However, such techniques prove effective only if coercive operators are present or if the Palais-Smale condition is met. In the examined cases, an algebraic approach based on the fibering method introduced by Pohozaev was adopted.

She has also analysed the blow up phenomena for the solution of non linear problems obtaining non existence results of global solutions for certain classes of inequalities and for systems of inequalities governed by elliptic and parabolic nonlinear operators. In this field , by using the a priori estimate method introduced by E. Mitidieri , S. Pohozaev it was possible to re-obtain known results by employing a much simpler technique, to generalise such results and to answer certain open questions formulated by scholars such as Pinsky, Souplet, Mitidieri and Pohozaev.

More recently her field of research has been extended to the following topics :

Integral inequalities applied to systems of differential equations with impulses; the properties of the subdifferential of functionals in Frechet spaces and their application in variational inequalities governed by multivalued pseudomonotone operators; properties of certain Banach and Frechet spaces with derivatives that can be integrated to obtain global solutions of differential inclusions and variational evolution inequalities governed by pseudomonotone operators.