Thursday, January 13th, 17:00 – 18:00

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The role of the Algebraic Multiplicity in Topological Degree Theory

In the foundational 1934 paper of the degree for compact perturbation of the identities (Leray & Schauder degree), the authors established a hidden relation between the degree and the Algebraic multiplicity of linear compact operators. This relation motivated Esquinas and López-Gomez to generalize in 1988 the concept of the algebraic multiplicity. In this talk, we will summarize the concept of the generalized algebraic multiplicity of Esquinas and López-Gomez through an early hidden relationship found by the speaker [3] of this concept and the notion of intersection multiplicity of algebraic varieties. Later, this construction will be used to relate, in an analogy to the formula of Leray & Schauder, the topological degree for Fredholm operators of Fitzpatrick, Pejsachowicz and Rabier (that include almost all the topological degrees known up to date) and the generalized algebraic multiplicity [1]. As a result of our findings [2], we will be able to prove an analogue of the axiomatization & uniqueness theorems of Fuhrer and Amann & Weiss to cover the degree of Fredholm operators of Fitzpatrick, Pejsachowicz and Rabier. Finally, we will show, though a nonlinear PDE example, how the developed geometrical techniques are used in applications.


Link to the seminar:
https://us06web.zoom.us/j/99649860282?pwd=SE0vemtYMFlwbFBNTXQyOTBONG0vZz09