

PH.D. IN MATHEMATICS AND COMPUTER SCIENCE

COURSE SCHEDULE

ACADEMIC YEAR 2022/2023

METRIC FIXED POINT THEORY

LECTURER: VITTORIO COLAO
UNIVERSITY OF CALABRIA

30 MAY - 05 JUNE

BANACH-CACCIOPPOLI FIXED POINT THEOREM, ALSO KNOWN AS CONTRACTION PRINCIPLE, CAN BE CONSIDERED ONE OF THE MOST IMPORTANT AND CELEBRATED THEOREMS IN ANALYSIS. INDEED ITS DIRECT APPLICATION ENSURES EXISTENCE, UNIQUENESS AND ITERATIVE APPROXIMATION OF SOLUTIONS TO FUNCTIONAL EQUATIONS. ANYWAY, EVEN A SMALL RELAXATION OF THE CONTRACTIVE HYPOTHESIS LEADS INTO LOSING AT LEAST ONE OF THE ABOVE CITED PROPERTIES OF THE SOLUTIONS. STARTING FROM THE ABOVE RESULT, WE WILL EXPLORE SEVERAL RESULTS CONCERNING GENERALIZATIONS OF CONTRACTIVE MAPPINGS IN SEVERAL DIRECTIONS. IN PARTICULAR WE WILL ANALYSE THE CASES WHEN EXISTENCE AND UNIQUENESS CAN BE RECOLLECTED AND EXPLORE THE STRUCTURE OF THE FIXED POINT SET. ITERATIVE APPROXIMATIONS WILL BE ALSO PART OF THE PROGRAM. SEVERAL APPLICATIONS TO ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS AND TO OPTIMIZATION AS WELL AS OPEN PROBLEMS WILL BE DISCUSSED.

CLASS SCHEDULE:

TUE 30/05 09:00 -12:00

WED 31/05 10:00 -13:00

THU 01/06 10:00 -13:00

MON 05/06 10:00 -13:00

CLASSROOM MT 14