

PH.D. IN MATHEMATICS AND COMPUTER SCIENCE

# COURSE SCHEDULE

ACADEMIC YEAR 2022/2023

## THE VEHICLE ROUTING PROBLEM AND ITS INNOVATIVE VARIANTS

LECTURER: GIUSY MACRINA  
UNIVERSITY OF CALABRIA

21 - 24 MARCH

THE VEHICLE ROUTING PROBLEM (VRP) IS A COMBINATORIAL OPTIMIZATION AND INTEGER PROGRAMMING PROBLEM WHICH AIMS AT FINDING OPTIMAL ROUTES FOR MULTIPLE VEHICLES VISITING A SET OF LOCATIONS. THE VRP IS ONE OF THE MOST IMPORTANT APPLICATIONS OF OPTIMIZATION SINCE IT HELPS DELIVERY COMPANY TO PLAN THEIR ROUTES FOR MAXIMIZING THE EFFICIENCY OF THE FLEET AND MINIMIZING THE COSTS. LAST MILE DELIVERY, THAT IS THE LAST LENGTH OF THE DELIVERY PROCESS, IS THE MOST EXPENSIVE PART OF THE FULFILMENT CHAIN; HENCE OPTIMIZING THE ROUTES, AVOIDING FAILED DELIVERIES AND ERRORS, IS A CHALLENGING ISSUE FOR THE COMPANIES. IN THIS COURSE WE WILL FOCUS ON THE VRP AND ITS VARIANTS, USING INNOVATIVE TECHNOLOGIES AND PARADIGMS, WHICH ALLOW TO CONSIDER SEVERAL REAL-LIFE CONSTRAINTS, AND PURSUE DIFFERENT, OFTEN CONFLICTING, GOALS (MINIMIZING COSTS, MAXIMIZING QUALITY OF SERVICE, MINIMIZING NEGATIVE ENVIRONMENTAL IMPACTS). AFTER INTRODUCING THE VRP AND THE VRP WITH TIME WINDOWS, WE WILL FOCUS ON THE GREEN VRP, THE VRP WITH CROWD-SHIPPING AND THE DRONE VRP.

### CLASS SCHEDULE:

TUE	21/03	9:00 - 12:00
WED	22/03	9:00 - 12:00
THU	23/03	14:30 - 17:30
FRI	24/03	9:00 - 12:00

• CLASSROOM MT 12

• ONLINE: <https://bit.ly/3Lm6esw>