PH.D. IN MATHEMATICS AND COMPUTER SCIENCE
COURSE SCHEDULE
ACADEMIC YEAR 2022/2023

THE SCHEDULING PROBLEMS: MATHEMATICAL FORMULATIONS AND SOLUTION APPROACHES

LECTURER: ROSITA GUIDO
UNIVERSITY OF CALABRIA

2 - 5 OCTOBER

SCHEDULING IS THE PROCESS OF ASSIGNING OPERATIONS TO RESOURCES OVER TIME TO OPTIMIZE ONE OR MORE CRITERIA. IT IS BASICALLY A DECISION-MAKING PROCESS FOR THE ALLOCATION OF RESOURCES. THE OBJECTIVE FUNCTIONS USED IN MOST OF THE RESEARCH WORKS CAN BE CATEGORIZED AS TIME RELATED, JOB RELATED, AND MULTIPLE OBJECTIVES. SCHEDULING PROBLEMS ARISE IN A VARIETY OF SETTINGS. MORE SPECIFICALLY, THEY ARE DEFINED BY THREE SEPARATE ELEMENTS: THE MACHINE ENVIRONMENT, THE OPTIMALITY CRITERION, AND A SET OF SIDE CONSTRAINTS AND CHARACTERISTICS.

IN THIS COURSE WE WILL FOCUS ON FLEXIBLE FLOW SHOP (FFS) SCHEDULING PROBLEMS IN A COMPLEX MACHINE ENVIRONMENT, THEIR VARIANTS BASED ON SEVERAL REAL-WORLD CONSTRAINTS AND MULTIPLE OBJECTIVES, AND EXACT AND HEURISTIC SOLUTION APPROACHES. WE FIRST PRESENT THE SIMPLEST MACHINE ENVIRONMENT AND INTRODUCE A VARIETY OF OPTIMALITY CRITERIA AND SIDE CONSTRAINTS. THEN, WE INTRODUCE AND DISCUSS MORE COMPLEX MACHINE ENVIRONMENTS, AS FFS SCHEDULING PROBLEMS WHICH CAN BE GENERALIZED BY TWO FUNDAMENTAL SCHEDULING PROBLEMS, I.E., THE FLOW SHOP SCHEDULING AND THE PARALLEL MACHINES SCHEDULING PROBLEMS.

1. THE SCHEDULING PROBLEMS: INTRODUCTION AND APPLICATIONS
2. SOME BASIC MATHEMATICAL FORMULATIONS OF SCHEDULING PROBLEMS: SINGLE OBJECTIVE AND MULTI-OBJECTIVE
3. FLOW SHOP AND JOB SHOP SCHEDULING PROBLEMS: STATE OF THE ART, CONSTRAINTS, APPLICATIONS
4. FLEXIBLE JOB SHOP SCHEDULING: STATE OF THE ART, CONSTRAINTS
5. FLEXIBLE JOB SHOP SCHEDULING: EXACT SOLUTION APPROACHES AND HEURISTICS

CLASS SCHEDULE:

MON 02/10 09:30 -12:30
TUE 03/10 09:30 -12:30
WED 04/10 09:30 -12:30
THU 05/10 09:30 -12:30

CLASSROOM MT 12
TEAMS CODE: A38KW5N