DM/DMP87 (10 ECTS) Skedulering, Skemalægning og Ruteplanlægning Scheduling, Timetabling and Routing

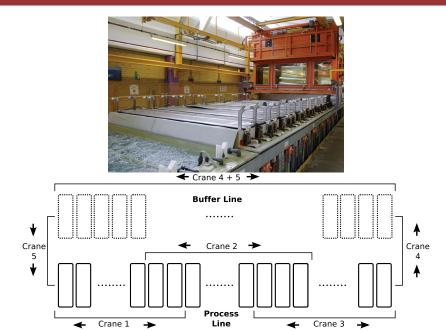
Marco Chiarandini, post doc.

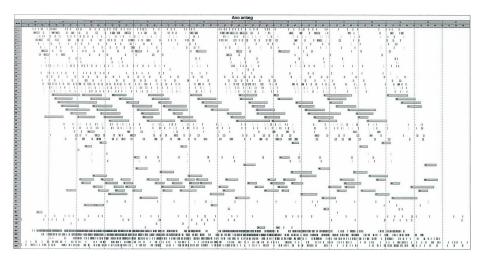
marco@imada.sdu.dk http://www.imada.sdu.dk/~marco/DM87

> IMADA University of Southern Denmark



Scheduling





Gantt chart

Eksempel på skema for førsteårene:

	Mandag	Tirsdag		Torsdag	Fredag
8	KE501F1 U55(36-41)	KE501F1 U55(36-37,39,41,45,49)	FY501F1 U55(36-39,41)	BB501F1 U55(36-38,40,43,47-51)	KE501F1 U55(36-41,43,45-50)
9	MM501E2 S1				FY501E2 St U10(37) FY501L3 S1 u32&33(40,43)
1 0	FY501E1 S1	KE501E2 S1		FY501E2 51 u328.33(37-39) FY501E1 51 u328.33(41) MM501F2 U55(45,47-51)	MM501E2 S1
11					
1 2	FY501F2 U55(36-41) MM501F2 U55(45-51)	BB501E2 S1 U10(37-41,43,46-51)	BB501F2 u55(36-37,41,45)		KE501F1
13				FV501E2 S1 U24(37-39) FV501E1 S1 U24(40-41)	BB501E1 S1
1 4	KE501E2 S1 u49d(36-97, 49-51)			KE501F1 ^{U55(47-40)}	BB501F2 U55(36-39,41,43,45-51)
15					
1 6		BB501F2 ^{U55(37-41,43,45-51)}			
17					
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Fig: Scienceår, S1.

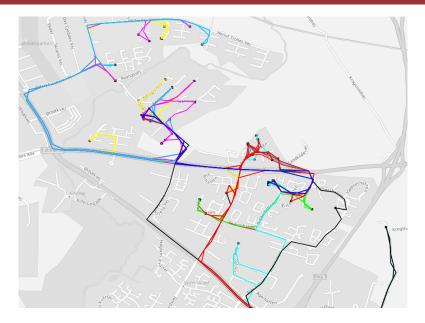
Timetabling

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Fig: Visningsform at for en lokale/time-oversigt

	Mandag	Tirsdag	Onsdag	Torsdag	Fredag	
8-9	DM63 (Sem)	MM/MMP36 (Sem)	DM40 (Sem)	MM10 (Sem)	DM518	
9-10	DM63 (Sem)	MM/MMP36 (Sem)	DM40 (Sem)	MM10 (Sem)	DM518	
10-11	MM67 (Sem)	DM518 (Sem)	MM22 (Sem)	DM63 (Sem)	MM67 (Sem)	
11-12	MM67 (Sem)	DM518 (Sem)	MM22 (Sem)	DM63 (Sem)	MM67 (Sem)	
12-13	$\rm DM/DMP42~(Sem)$	DM40 (Sem)	$\rm DM/DMP42~(Sem)$	$\rm DM/DMP49~(Sem)$	MM22 (Sem)	
13-14	$\rm DM/DMP42~(Sem)$	DM40 (Sem)	$\rm DM/DMP42~(Sem)$	$\rm DM/DMP49~(Sem)$	MM22 (Sem)	
14-15	$\rm DM/DMP49~(Sem)$	Dat.Koll. (Sem)	MM10 (Sem)	MM/MMP36 (Sem)	Op.Alg.Koll. (Sem)	
15-16	$\rm DM/DMP49~(Sem)$	Dat.Koll. (Sem)	MM10 (Sem)	MM/MMP36 (Sem)	Op.Alg.Koll. (Sem)	
16-17				Mat.Koll. (Sem)		
17-18				Mat.Koll. (Sem)		

Vehicle Routing

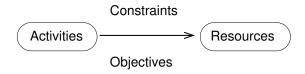




- Jakob Skov, Scheduling of an Anodizing Plant at Bang & Olufsen. Master Thesis, 2007.
- Anders Rasmussen. Skemalgning for naturvidenskab ved SDU. Master Thesis, 2007
- Steffen Elberg Godskesen. Automated Planning of Work for Home Nurses. Master Thesis, 2006.

Contents: Modeling

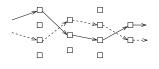
Scheduling

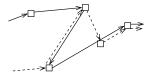


Single and Parallel Machine

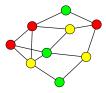
Flow Shop and Flexible Job Shop, Open Shop Flow Shop







Interval Scheduling, Reservations



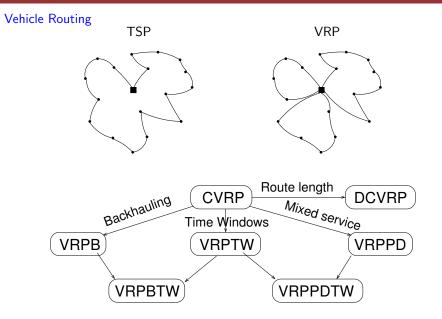
Educational and Employee Timetabling

		Periods							
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	R _r	L ₃	L ₇		L_{13}		L_{16}		_

Transportation Timetabling

DM/DMP87 – Scheduling, Timetabling and Routing

Contents: Modeling



Contents: Solution Techniques

- Mathematical Programming
- Networks
- Branch and Bound
- Constraint Programming
- Dedicated algorithms
- Dispatching Rules and Construction Heuristics
- Metaheuristics: SA, Tabu Search, GA

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Course prerequisites

- MM02 (linear algebra)
- DM02 (algorithms and data structures)
- The content of DM63 should be known
- DM85 (Networks and Integer Programming) would be reccomended

During the Course (30 hours of lectures, 2-4 hours per week)

- Study concepts from text book and additional materials (5-6 hours per week of work load)
- Apply the knowledge on the case studies proposed in class (participatory discussions)
- Read and present an article

Final Assessment (10 ECTS)

- Oral exam of 30 minutes with external examiner (60% of final grade) meant to assess the base knowledge
- Group project (40% of the final grade) approved choice of a case study deliverables: program + report meant to assess to ability to apply

Text book:

 M.L. Pinedo, Planning and Scheduling in Manufacturing and Services; Springer Series in Operations Research and Financial Engineering, 2005, (388 DKK)

Supplementary books:

- M.L. Pinedo, Scheduling: Theory, Algorithms, and Systems; 2nd ed., Prentice Hall, 2002.
- P. Toth, D. Vigo, eds. The Vehicle Routing Problem, SIAM Monographs on Discrete Mathematics and Applications, Philadelphia, 2002.

Further literature:

- Lecture notes
- Articles

DM/DMP87 (10 ECTS) Skedulering, Skemalægning og Ruteplanlægning Scheduling, Timetabling and Routing

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> IMADA University of Southern Denmark

