Link: project 1 Link: project 2 **Marks: two projects (50pts each) * board test (coefficient [0,7 - 1,1])** SYLLABUS

Use Google-OR Tools for your programs

Copy/paste in your browser

Session/Timeline	Tutorial/Oral exam	Idea / Concept	Lecture	Practice	Video	May be use on project…
none	none	***Decision making/motivation***	Decision making			none
1	Tutorial 1	***Complexity***		**Complexity in a Smart Grid context**		
		→ *definition*	Complexity		/watch?v=PFd5s0bHgAQ	none
		→ *big oh notation*	Big oh	Complexity	"	none
2	Tutorial 2	***Graph theory's basics***		**Graph theory for a reliable model**		
		→ *Un/directed graph*	Graph Basics	Modelling and basics		1, 2
		→ *Degree*	"	"		1, 2
		→ *Path/cycle*	"			1, 2
		→ *Tree*	"		/watch?v=BptJFixSseM	1, 2
		→ *Subgraph*	"			1, 2
		→ *Complete graph*	"			1, 2
3	Tutorial 3	→ *Eulerian circuit*	Graph: problems		/watch?v=5M-m62qTR-s	1
		→ *Hamiltonian circuit*	"		/watch?v=AamHZhAmR7o	1
		→ *Graph coloring*	"	Graph coloring	/watch?v=4FE79y_JkCE	1
4	Tutorial 4	***Spanning tree***		**Spanning tree in a Smart Grid context**		
		→ *Kruskal's algorithm*	Graph: problems	MST (Kruskal)	/watch?v=71UQH7Pr9kU	1
		→ *Prim's algorithm*	"	MST (Prim)	/watch?v=cplfcGZmX7I	1
End of project 1		*extra: how to solve*			/watch?v=YYR5bgsHb-w	
5 & 6	Tutorial 5	***Shortest path problem***		**Shortest path in a Smart Grid context**		
		→ *linear program*	Shortest path 1		/watch?v=33NaclLw1ug	1, 2
		→ *dynamic program*	"	DynPro	/watch?v=W2ote4jCuYw	1, 2
		→ *Dijkstra's algorithm*	Shortest path 2	SP (Dijkstra)	/watch?v=8Ls1RqHCOPw	1, 2
		→ *DAG algorithm*	"		/watch?v=Q-WOZNbhUqc	1, 2
		→ *Bellman-Ford's algorithm*	"	SP (Ford-Bellman)	/watch?v=iTW2yFYd1Nc	1, 2
		→ *Floyd-Warshall's algorithm*	Shortest path 3	SP (Floyd-Warshall)	/watch?v=KQ9zlKZ5Rzc	1, 2
		extra: how to solve			/watch?v=V4B-DK4zBBo	
7 & 8	Tutorial 6	***Flow problem***		**Flow problem in a Smart Grid context**		
		→ *min cut problem*	Min cut	MF-mC (mC analysis)	/watch?v=W6FADBtNFeA	2
		→ *flows and cut*	"	"	"	2
		→ *max flow problem*	Max flow	"	"	2
		→ *augmenting path*	"		"	2
		→ *Ford-Fulkerson's algorithm*	"	MF-mC (Ford-Fulkerson)	/watch?v=Tl90tNtKvxs	2
		extra: how to solve			/watch?v=cztF4L370M8	
9&10	Tutorial 7	***Transportation problem***		**Transportation problem in a Smart Grid context**		
		→ *definition and special cases*	Transportation problem	Transportation = flow	/watch?v=WZIyL6pcItY	2
		→ *initial solution*	"		/watch?v=ItOuvM2KmD4	2
		→ *stepping stone algorithm*	Stepping stone			2
		→ *degeneracy*	"	Degeneracy		2
End of project 2		*extra: how to solve*			/watch?v=RZX2bmoCzLI	

REF

Introduction to Algorithms: Cormen, T et Leiserson, C

The Algorithm Design Manual: Steven S. Skiena

Electric Power System Applications of Optimization, Second Edition: James A. Momoh