

## Schedule

### Monday, July 31

Time	Topics (include lectures, hands-on work, laboratory work and social events as applicable)	Instructor(s)	Readings/ Assignments
10-11am	Introduction to Graph Theory and Applications of Graphs <ul style="list-style-type: none"> <li>- Definitions of graph structures</li> <li>- Introduction to graph problems</li> <li>- Real life examples of graphs</li> </ul>	Julian Shun	
11-11:15am	Break		
11:15am-12pm	Structure of Real-World Graphs <ul style="list-style-type: none"> <li>- Structure of the Web</li> <li>- Power laws</li> </ul>	Julian Shun	
12-1pm	Lunch Break		
1-2pm	Structure of Real-World Graphs <ul style="list-style-type: none"> <li>- Small world phenomenon</li> <li>- Decentralized search</li> <li>- Synthetic graph generation</li> </ul>	Julian Shun	
2-2:30pm	Q&A		

### Tuesday, August 1

Time	Topics (include lectures, hands-on work, laboratory work and social events as applicable)	Instructor(s)	Readings/ Assignments
10-11am	Graph Algorithms	Julian Shun	

	- Link analysis and Web search		
11-11:15am	Break		
11:15am-12pm	Graph Algorithms - Graph representations - Graph traversal	Julian Shun	
12-1pm	Lunch Break		
1-2pm	Graph Algorithms - Topological sort - Strong connectivity - Shortest paths	Julian Shun	
2-2:30pm	Q&A		

### Wednesday, August 2

Time	Topics (include lectures, hands-on work, laboratory work and social events as applicable)	Instructor(s)	Readings/ Assignments
10-11am	Demo and Exercises with Graph Processing Software (NetworkX) - Creating graphs - Running graph algorithms - Graph visualization	Julian Shun	
11-11:15am	Break		
11:15am-12pm	Large-Scale Graph Processing Frameworks - Parallel computing - Programming abstractions - Performance analysis	Julian Shun	
12-1pm	Lunch Break		

1-2pm	Large-Scale Graph Processing Frameworks <ul style="list-style-type: none"> <li>- Parallel computing</li> <li>- Programming abstractions</li> <li>- Performance analysis</li> </ul>	Julian Shun	
2-2:30pm	Q&A		

**Thursday, August 3**

<b>Time</b>	<b>Topics</b> (include lectures, hands-on work, laboratory work and social events as applicable)	<b>Instructor(s)</b>	<b>Readings/ Assignments</b>
10-11:30am	Machine Learning on Graphs <ul style="list-style-type: none"> <li>- Graph representational learning</li> <li>- Graph neural networks</li> </ul>	Julian Shun	
11:30am-12:30pm	Lunch Break		
12:30-2pm	Problem Clinic <ul style="list-style-type: none"> <li>- Small-group discussion of graph problems submitted by participants</li> <li>- Presentations of each group to the whole class</li> </ul>	Julian Shun	
2-2:30pm	Q&A	Julian Shun	