**Additional Topics for Undergraduates that are unavailable are crossed. Each topic requires studying the textbook and cited papers and presenting the findings in a 25-minute presentation + 5-minute questions.**

1. Section 4.12-13 Advanced Topic 4.B: Plotting power laws and 4.C Estimating the degree exponent

2. Section 6.3: Measuring fitness of evolving networks

~~3. Section 9.4.3:~~ ~~Limits of modularity and optimized greedy algorithms;~~ Arvind Bhamidipati

~~4. Section 9.5.1-9.5.2, Clique and link percolation~~ Yashasvi Kishore

5. Section 9.12 Advanced Topic C: Fast Algorithm for Community Detection

~~6. Section 10.2:~~ ~~Epidemic modeling;~~ Xie, Tim

~~7. Section 10.3: Epidemics on networks~~ Watabe, Seth

~~10. Section 10.4:~~ ~~Contact networks patches~~ Bijun Wu

~~11. Section 10.5:~~ ~~Beyond the degree distribution~~ Tianshi Zhou

~~12. Section 10.6~~~~: Immunization; https://arxiv.org/pdf/1908.04901.pdf~~ Nicholas Pacey

13. Section 3.14-15 Advance Section 9.6 1: Testing communities; IEEE Tran Knowledge & Data Engineering, 2019.

14. Advanced Topics 3.C Giant component and 3.D Component sizes

**Papers only for short undergraduate presentations**

~~1.~~ [~~From Data to Complex Network Control of Airline Flight Delays~~](https://www.nature.com/articles/s41598-021-98112-7)~~, Xiang Niu, Chunheng Jiang, Jianxi Gao, G. Korniss, Boleslaw K. Szymanski,~~ *~~Sci Rep~~***~~11~~**~~:18715, Sept., 2021~~. Pike, Sarah

~~2.~~ [~~Social Networks through the Prism of Cognition,~~](https://downloads.hindawi.com/journals/complexity/2021/4963903.pdf) ~~Radoslaw Michalski, Boleslaw K. Szymanski, Przemyslaw Kazienko, Christian Lebiere, Omar Lizardo, Marcin Kulisiewicz,~~ *~~Complexity~~*~~,~~ **~~2021~~**~~:4963903, Jan., 2021~~ Nicolay Dylan

~~3.~~ ~~[Entropy Measures of Human Communication Dynamics](http://www.nature.com/articles/s41598-018-32571-3), Marcin Kulisiewicz, Przemyslaw Kazienko, Boleslaw K. Szymanski, Radoslaw Michalski,~~ *~~Scientific Reports,~~***~~8~~**~~:15697. Oct. 2018~~ Baccay, Lucas

4. [Balancing Speed and Coverage by Sequential Seeding in Complex Networks](https://www.nature.com/articles/s41598-017-00937-8), Jarosław Jankowski, P. Brodka, P. Kazienko, B. K. Szymanski, R. Michalski, T. Kajdanowicz, *Scientific Reports* **7**:891, Apr., 2017.

~~5.~~ [~~Temporal Network Epistemology: on Reaching Consensus in Real World Setting,~~](https://doi.org/10.1063/5.0074992) ~~Radoslaw Michalski, Damian Serwata, Mateusz Nurek, Boleslaw K. Szymanski, Przemyslaw Kazienko, Tao Jia,~~ *~~Chaos~~***~~32~~**~~(6):063135, June 27, 2022~~. Tate Whiteberg