Integer Programming 2 Exam Topics, Autumn 2019

1. Gomory-Chvátal cuts, Chvátal rank (Schrijver 23.1 23.2, 23.4)
2. Cuts for the Traveling Salesman Problem: blossom cuts and their separation problem (CCPS 6.8, 7.4)
3. Covering cuts and clique cuts. Lifting cuts in binary problems; application to the stable set polytope and to covering cuts (NW II.2.1, II.2.2)
4. Lift and project methods (`https://homepages.cwi.nl/~monique/files/lift.ps`)
5. Semidefinite programming. The Lovász ϑ function. The Goemans-Williamson algorithm for approximating MAXCUT (`http://homepages.cwi.nl/~monique/files/laurent.pdf`)
6. Geometric lattices, reduced bases (Schrijver 4, 6.2; NW I.7)
7. The LLL algorithm; approximation algorithm for the Closest Vector problem (Schrijver 6.2, 6.3; NW I.7.5)
8. Simultaneous diophantine approximation. Polynomial-time algorithm for integer programming in constant dimension. (Schrijver 6.3. 18.4; NW I.7.5, II.6.5)
9. Iterative rounding algorithm for the undirected network design problem (`http://www.kurims.kyoto-u.ac.jp/~kenkyubu/bessatsu/open/B23/pdf/B23_009.pdf`)

List of resources referred above:

- A. Schrijver, Theory of Linear and Integer Programming, ISBN: 978-0-471-98232-6
- W.J. Cook, W.H. Cunningham, W.R. Pulleyblank, A. Schrijver, Combinatorial Optimization, `http://dx.doi.org/10.1002/9781118033142`
- G.L. Nemhauser, L.A. Wolsey, Integer and Combinatorial Optimization, `http://dx.doi.org/10.1002/9781118627372`

Note that these resources do not cover the topics exactly the same way as the lectures.