

Course Outline for Random Matrix Theory for Wireless Communications

Instructor:

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Tentative Course Outline:

Part I: Theoretical aspects

1. The Stieltjes transform method
2. Free probability theory
3. Combinatoric approaches
4. Deterministic equivalents
5. Spectrum analysis
6. Eigen-inference
7. Extreme eigen-values

Part II: Applications to wireless communications

1. System performance of CDMA technologies
2. Performance of multiple antenna systems
3. Rate performance in multiple access and broadcast channels
4. Performance of multi-cellular and relay networks
5. Detection and estimation

Recommended textbook:

Romain Couillet and Me´rouane Debbah, Random Matrix Methods for
Wireless Communications,

Cambridge University Press, 2011

Grading:

One Presentation 20%
One Project 30%
Final Exam 50%

Term:

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