

# EE641 Model-Based Image and Signal Processing

## Fall 2017 – Lecture, Homework, and Laboratory Schedule

| Session # (Day)              | Readings Due      | Homework Due | Laboratory Due                  | Topic                      |
|------------------------------|-------------------|--------------|---------------------------------|----------------------------|
| 1. (Aug. 21)                 | Chapter 1         |              |                                 | Introduction               |
| 2. (Aug. 23)                 | Chapter 2.1       |              |                                 | Probability                |
| 3. (Aug. 25)                 | Chapter 2.2       | Homework #1  |                                 | Probability                |
| 4. (Aug. 28)                 | Chapter 2.3       |              |                                 | Probability                |
| 5. (Aug. 30)                 | Chapter 2.4       |              |                                 | Probability                |
| 6. (Sept. 1)                 | Chapter 3.1-3.2   | Homework #2  |                                 | Causal Gaussian Models     |
| *****Labor Day*****          |                   |              |                                 |                            |
| 7. (Sept. 6)                 | Chapter 3.3       |              |                                 | Causal Gaussian Models     |
| 8. (Sept. 8)                 | Chapter 3.4       | Homework #3  |                                 | Causal Gaussian Models     |
| 9. (Sept. 11)                | Chapter 4.1-4.2   |              |                                 | Non-Causal Gaussian Models |
| 10. (Sept. 13)               | Chapter 4.3-4.4   |              |                                 | Non-Causal Gaussian Models |
| 11. (Sept. 15)               | Chapter 4.5-4.6   | Homework #4  |                                 | Non-Causal Gaussian Models |
| 12. (Sept. 18)               | Chapter 5.1       |              |                                 | MAP with Gaussian Priors   |
| 13. (Sept. 20)               | Chapter 5.2       |              |                                 | MAP with Gaussian Priors   |
| 14. (Sept. 22)               | Chapter 5.3       | Homework #5  |                                 | MAP with Gaussian Priors   |
| 15. (Sept. 25)               | Chapter 5.4-5.5   |              |                                 | MAP with Gaussian Priors   |
| 16. (Sept. 27)               | Chapter 6.1       |              |                                 | Non-Gaussian MRFs          |
| 17. (Sept. 29)               | Chapter 6.2       |              |                                 | Non-Gaussian MRFs          |
| 18. (Oct. 2)                 | Chapter 6.3-6.4   |              | MAP Image Restoration Parts 1-2 | Non-Gaussian MRFs          |
| 19. (Oct. 4)                 | Chapter 7.1-7.2   |              |                                 | Non-Gaussian MAP           |
| 20. (Oct. 6)                 | Chapter 7.3       | Homework #6  |                                 | Non-Gaussian MAP           |
| *****October Break*****      |                   |              |                                 |                            |
| 21. (Oct. 11)                | Chapter 8.1-8.2   |              |                                 | Non-Gaussian MAP           |
| 22. (Oct. 13)                | <b>Exam</b>       |              |                                 | <b>Exam</b>                |
| 23. (Oct. 16)                | Chapter 8.3-8.4   |              |                                 | Non-Gaussian MAP           |
| 24. (Oct. 18)                | Chapter 9.1       |              |                                 | Constrained Optimization   |
| 25. (Oct. 20)                | Chapter 9.2       | Homework #7  |                                 | Constrained Optimization   |
| 26. (Oct. 23)                | Chapter 9.3       |              |                                 | Constrained Optimization   |
| 27. (Oct. 25)                | Chapter 9.4       |              |                                 | Constrained Optimization   |
| 28. (Oct. 27)                | Chapter 11.1-11.2 |              | MAP Image Restoration Parts 3   | EM Algorithm               |
| 29. (Oct. 30)                | Chapter 11.3-11.4 |              |                                 | EM Algorithm               |
| 30. (Nov. 1)                 | Chapter 11.5-11.6 |              |                                 | EM Algorithm               |
| 31. (Nov. 3)                 | Chapter 11.7      | Homework #8  |                                 | EM Algorithm               |
| 32. (Nov. 6)                 | Chapter 12.1-12.2 |              |                                 | Markov Chains and HMMs     |
| 33. (Nov. 8)                 | Chapter 12.3      |              |                                 | Markov Chains and HMMs     |
| 34. (Nov. 10)                | Chapter 12.4      | Homework #9  | The EM Algorithm                | Markov Chains and HMMs     |
| 35. (Nov 13)                 | Chapter 13.1-13.2 |              |                                 | General MRFs               |
| 36. (Nov 15)                 | Chapter 13.3      |              |                                 | General MRFs               |
| 37. (Nov 17)                 | Chapter 13.4      | Homework #10 |                                 | General MRFs               |
| 38. (Nov. 20)                | Chapter 14.1-14.2 |              |                                 | Stochastic Simulation      |
| *****Thanksgiving Break***** |                   |              |                                 |                            |
| *****Thanksgiving Break***** |                   |              |                                 |                            |
| 39. (Nov. 27)                | Chapter 14.3      |              |                                 | Stochastic Simulation      |
| 40. (Nov. 19)                | Chapter 14.4      |              |                                 | Stochastic Simulation      |
| 41. (Dec. 1)                 | Chapter 14.5      | Homework #11 |                                 | Stochastic Simulation      |
| 42. (Dec. 4)                 | Chapter 15.1      |              |                                 | MAP Segmentation           |
| 43. (Dec. 6)                 | Chapter 15.1      |              |                                 | MAP Segmentation           |
| 44. (Dec. 8)                 |                   |              | Discrete MRFs and Segmentation  | Review                     |