Lecture Schedule

NRES 746

Fall 2018

## Lecture schedule

Becuase this is just the second time this course is being taught, this schedule is subject to change. Please check for updates frequently!

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| Week | Lecture.1 | Lecture.2 | Material.Covered | Readings |
| Aug. 27 | Course Introduction | Probability | Review syllabus, algorithmic approach to data analysis, basic programming in R | Clark Ch. 1; Touchon and McCoy 2016 |
| Sept. 3 | NA (labor day) | Probability | Basic probability calculus, working with probability distributions | Bolker ch. 4; Zurell et al. 2010; |
| Sept. 10 | The Virtual Ecologist | The Virtual Ecologist | Generating data algorithmically, mechanistic models, power analysis, goodness-of-fit testing | Bolker Ch. 1, Ch 5.; Zuur et al. 2010 (optional) |
| Sept. 17 | Likelihood | Likelihood | Maximum likelihood estimation | Bolker Ch. 6; Hobbs and Hilborn 2006 (optional) |
| Sept. 24 | Likelihood | Optimization | Optimization algorithms for maximum likelihood inference | Bolker Ch. 7 |
| Oct. 1 | Optimization | Bayesian inference | General introduction to Bayesian theory and application | Bolker Ch. 6 and 7 (Bayesian section); Ellison 2004 |
| Oct. 8 | Bayesian inference | Markov Chain Monte Carlo (MCMC) | Markov-Chain Monte Carlo | Bolker Ch. 7 and 8 |
| Oct. 15 | Markov Chain Monte Carlo (MCMC) | Model selection and multi-model inference | Model selection | Anderson et al. 2000; Anderson et al. 2001; Wintle et al. 2003 |
| Oct. 22 | Model selection and multi-model inference | Model validation and performance evaluation | Bias-variance tradeoff, cross-validation, assessing predictive accuracy | TBD |
| Oct. 29 | Model validation and performance evaluation | Machine-learning? | Bias-variance tradeoff, cross-validation, assessing predictive accuracy | TBD |
| Nov. 5 | Time-series analysis | Path analysis/SEM | Student-led topics | TBD |
| Nov. 12 | NA (veteran’s day) | Ordination | Student-led topics | TBD |
| Nov. 19 | Bayesian Networks | Mixed effects models | Student-led topics | TBD |
| Nov. 26 | Modeling spatial correlation | Quantile regression | Student-led topics | TBD |
| Dec. 3 | Resource Selection Functions | Random Forest | Student-led topics | TBD |
| Dec. 10 | Class wrap-up | NA (prep day) | Student-led topics |  |