

Syllabus for BIOL 701: Likelihood Methods in Biology

Monday and Wednesday 10-10:50 AM

2025 Haworth

Course website: <http://phylo.bio.ku.edu/courses/likelihood>

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Holder office hours: Monday at 1:00-1:50PM and by appt.

Kelly: Office hours by appt.

Grades will be based on class participation and homework assignments. We will have approximately one homework assignment per week.

Approximate Schedule of Topics

<u>Week 1</u>	Jan 20	Probability, random variables, distributions
<u>Week 2</u>	Jan 25, Jan 27	Random samples, sample distributions, likelihood
<u>Week 3</u>	Feb 01, Feb 03	Explicitly specifying variability: likelihood examples
<u>Week 4</u>	Feb 08, Feb 10	Maximum likelihood estimation and Markov chains
<u>Week 5</u>	Feb 13, Feb 17	Generalized Linear Models
<u>Week 6</u>	Feb 22, Feb 24	Generalized Linear Models (continued)
<u>Week 7</u>	Feb 29, Mar 04	Likelihood ratio test statistic and Model Selection
<u>Week 8</u>	Mar 07, Mar 09 Mar 14 - Mar 16	Introduction to Bayesian methods SPRING BREAK
<u>Week 9</u>	Mar 21, Mar 23	Parametric bootstrapping
<u>Week 10</u>	Mar 28, Mar 30	Computational aspects: numerical optimization
<u>Week 11</u>	Apr 04, Apr 06	Computational aspects: Markov chain Monte Carlo (MCMC)
<u>Week 12</u>	Apr 11, Apr 13	Multiparameter MCMC
<u>Week 13</u>	Apr 18, Apr 20	Hastings ratio and model jumping
<u>Week 14</u>	Apr 25, Apr 27	Special topics: based on student suggestions
<u>Week 15</u>	May 02, May 04	Special topics: based on student suggestions