

Points of Emphasis in M213

In M213, students should be given frequent opportunities to use technology to simulate chance experiments and sampling methods to increase understanding (LP 7).

Whereas a typical instructional unit on probability might involve fabricated, artificial scenarios, in M213, students should be given opportunities to reason with probability in ways that are relevant to the field of Data Science. In M213, students should:

- recognize that different types of probability distributions or approximations to probability distributions are helpful for different purposes or for particular contexts (LP 3).
- mathematically claim and employ reasoning to justify a solution or its reasonableness (LP 3).
- regularly encounter real-world tasks involving discrete or continuous distributions that require them to compute probabilities to make sense of the plausibility of a prediction (LP 1).
- be able to choose tasks or entire courses that are organized around different scientific, social, or other topics, allowing students to have agency in their learning (LP 4).
- frequently collaborate, share their solution methods, and make their thinking visible (LP 2).

Specifically, in M213, students should:

- regularly employ previously learned probability concepts and skills, namely, designing simulations, using models to determine probabilities, computing probabilities of compound events, interpreting probabilities in context, and understanding independence and conditional probability. The focus of M213 is to build on these skills and apply them to the field of Data Science.
- regularly engage with tasks that do not require any computation, but instead focus on understanding and reasoning with sampling distributions and various types of probability distributions. For example, students should:
 - understand probabilities as the long-run relative frequency of an event;
 - relate probability models to simulations and sampling distributions;
 - explain the real-world meaning of probabilities;
 - compare probabilities;
 - consider prior events and knowledge that may affect a probability;
 - use a probabilistic model to justify a claim about a real-world context;
 - use probability to make decisions (LP 3).
- have opportunities to share their reasoning with partners or in groups, allowing for practice sharing, critiquing, and revising their arguments and including social interaction as part of the learning process (LP 2).

Students should also be given opportunities to understand and reflect on the ways that probability, Bayesian reasoning, and sampling distributions can authentically involve real-world situations (LP 6).