Q&A

If you had to create the ideal science course for first-year college students, what would it look like?

Science is changing. Boundaries between disciplines are fading. Shouldn’t this be reflected in the way we train future scientists? Below, four educators describe their dream introductory science class.

–Ed

By Harold (Hal) B. White
HHMI Professor, University of Delaware

“My ideal introductory science course would enroll fewer than 50 students. They would work in small groups on engaging projects and activities that focus on understanding one substantive interdisciplinary concept like randomness, equilibrium, or natural selection—ideas that fundamentally affect our world and how we perceive it. The course would not attempt to survey a discipline or fill students’ heads with facts and definitions. Instead, the goal would be to stimulate attitudes of scientific inquiry that can enable learning beyond formal education and promote responsible citizenship.”

Isiah Warner
HHMI Professor, Louisiana State University

“I would structure my ideal class quite differently than today’s average classes. I would teach physics, chemistry, and biology at the same time. Students would learn fundamental scientific principles and simultaneously explore them in an adaptable laboratory setting. The lab would be used to verify or enforce the lecture concepts and would allow experimentation and open discussion. Students who grasp the concepts could help students who don’t understand them. Both sets of students would benefit from this approach.”

Catherine Drennan
HHMI Investigator and HHMI Professor, Massachusetts Institute of Technology

“As a chemist who works at the interface of chemistry, biology, and medicine, one of my personal missions is to help first-year college students appreciate the power and beauty of chemistry. Thus, my ideal course conveys the basic chemical principles in a way that helps students see the connection between chemistry and other disciplines. My ideal course is not a history lesson. Rather, it provides snapshots of how chemical principles are employed in modern-day research and how chemistry can be used to solve real-world problems in medicine and engineering.”

Diane O’Dowd
HHMI Professor, University of California, Irvine

“All science courses should provide both students and instructors with the opportunity for intellectual discovery. My ideal first-year biology course would be concept driven, using real-world problems to motivate students. This process encourages the instructor to stay current with cutting-edge developments across a broad range of topics. I think it’s also important to stimulate dialogue in class so that students learn from each other and can practice problem solving in a mentored setting. Classroom discourse also gives the instructor interesting, and often unexpected, insights into the learning process, which can guide course revisions to improve outcomes.”