

# Biology without Borders: An Integrative Strategy for Increasing Conceptual Resonance among Biology Majors

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An effective biology program requires that students learn the core biology material, be proficient in other subjects (such as calculus and statistics) and develop related skills (laboratory and critical thinking), for a holistic understanding of biological concepts. Conventional biology departments typically require courses like calculus and/or statistics for their majors but tend to treat such courses as separate entities, with minimal focus on the connections between them. We present here a pedagogical paradigm called '*The Teaching Pentagon*'. The Teaching Pentagon eliminates the artificial endpoint that tends to be placed after biology and biology-related classes. Biology major courses can be developed in lockstep with other 'supporting' classes, thus increasing the resonance of the subject within the students. This synchronized-syllabi approach *increases efficacy* of the teaching process by maintaining open lines of communication among instructors of the courses that constitute the pentagon, and *maximizes student engagement*. The end result is *immediate contextualization* of the material so that the information is understood and integrated into a scaffold of knowledge and not merely regurgitated on examinations. This mechanism is malleable, and 'supporting' classes are determined by the needs of the 'principal' biology class. We use as an example in this presentation, General Biology II, a typical second-semester entry-level course for biology majors.

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