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Houghton Mifflin Publishes Trailblazing Chemistry Textbooks Written by Four Illinois Wesleyan Professors

BLOOMINGTON, Ill.—Houghton Mifflin Co., one of the nation's leading publishers, is using an innovative retailing strategy—the Internet—to market two new textbooks for a sweeping new undergraduate chemistry curriculum written by four Illinois Wesleyan University professors.

"The IWU project," said Timothy Rettich, associate professor of chemistry and co-author of the textbooks, "is one of only two chemistry texts Houghton Mifflin is featuring on its web pages devoted to textbooks.

"Out of 17 general chemistry offerings and eight organic chemistry offerings," Rettich added, "only our text and [Seyhan] Ege's 'Organic Chemistry,' a best-seller, have their own web pages at Houghton Mifflin."

Two Books, Four Authors

The two-book set, authored by the IWU chemists and published last month, is called, "Integrated Chemistry: A Two-Year General and Organic Chemistry Sequence."

The IWU authors are David Bailey, professor of chemistry; Forrest Frank, associate professor of chemistry, who retired in May, 1999, but remains a part-time faculty member; Jeff Frick, associate professor of chemistry and department chair, and Rettich.

Web Site Addresses

The Houghton Mifflin web site can be reached at <<http://www.hmco.com/college>>. From there, information about "Integrated Chemistry" can be obtained by linking to "chemistry" and then either "general chemistry" or "organic chemistry." Alternatively, the IWU project textbooks can be directly accessed at:

<http://www.hmco.com/college/chemistry/general/rettich/index.html>.

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Textbooks Described

The Houghton Mifflin web site describes the textbooks this way: “An alternative to the traditional curriculum and approach, the ‘Integrated Chemistry’ series blends the first two years of undergraduate coursework. This two-volume series represents a course sequence that explicitly addresses the needs and special interests of biology majors and premed students. By presenting organic chemistry earlier in the curriculum, the ‘Integrated Chemistry’ series demonstrates the connection of this material to students’ other fields of study, motivating them to succeed.”

Houghton Mifflin continues: “Also, since math preparation weighs heavily on student success in chemistry, the series allows professors to delay presenting, until the third or fourth semester, topics from general and organic chemistry that will most benefit students *after* their completion of college-level math. This new curriculum model gives students more time to develop math and study skills before tackling the more complex quantitative problems . . . ”

90 Years’ Experience

The authors—who collectively have spent nearly 90 years teaching the traditional first-year (general chemistry) and second-year (organic) chemistry sequence—point out in a web-site article:

“Over that time, our experience showed that capable and motivated students often found chemistry too abstract, too theoretical, and uninspiring. Students would likely finish a year of the traditional curriculum with little or no idea of what most chemists actually do.

“Even those students who were sufficiently inspired to continue their studies in science beyond organic chemistry,” they added, “apparently made few of the vital connections between the traditional first- and second-year courses. Those reinforcing links, the parallels that were obvious to the teachers were

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completely hidden from the students actually going through the process for the first time.”

The authors concluded: “Our curriculum was tightly bound by disciplinary divisions . . . We had a curriculum that, although commonly taught across most college campuses, satisfied neither the instructors nor the students.”

Authors’ Dream

In place of the traditional chemistry curriculum, the IWU authors said they “dreamed of a course that would bring all the major branches of chemistry into view starting the very first semester: a course that allowed a student to appreciate much of what practicing chemists actually do: a course that led students from observations to theories, not the reverse. We realized, however, that without the appropriate texts, our dream course would never materialize.”

Kudos and Comments

Soft cover editions of the chemistry textbooks were used on an experimental basis at several campuses. Instructors at those colleges and universities offered positive feedback:

- San Jose State University: “We ought to be integrating content to emphasize to students that the same principles serve as the foundation of ALL our chemistry courses. Illinois Wesleyan is leading the way in this long overdue innovation. For students requiring both general and organic chemistry in their academic programs, a complete blending of content is logical, sensible, and it works!”

- Bellarmine College (Louisville, Ky.): “‘Tastes great, less filling.’ The aspect of the course that has been most appealing to me has been the early introduction of spectroscopy. It is my view that applications of spectroscopy build critical thinking skills more extensively than any other topic we cover. Students may struggle through the material, but they learn how to solve

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problems in the process. There is nothing comparable to this in the typical general chemistry course.”

The chemistry textbooks remain in use at the five campuses where they were tested on a trial basis: IWU, Illinois College, Huntington College (Ind.), Bellarmine College (Ky.), and San Jose State University (Calif.).

Project Background

Development of the new chemistry courses was underwritten by a \$140,000, three-year grant from the National Science Foundation (NSF).

Houghton Mifflin’s interest in the new chemistry curriculum was sparked when a senior editor read an article about the project in the *Journal of Chemical Education*. He contacted the IWU professors, came to campus for a visit, and hired external readers who favorably reviewed the textbooks underdevelopment.

The IWU foursome has diverse interests in chemistry: Bailey concentrates on analytical chemistry, which focuses on qualitative and quantitative measurements; Frank is an organic chemist interested in forensics and chemistry as a crime-fighting tool; Frick focuses on organic and biochemistry; and Rettich’s interest zeroes-in on physical chemistry.

About IWU

IWU, founded in 1850, enrolls more than 2,070 students in a College of Liberal Arts, and individual schools of Music, Theatre Arts, Art, and Nursing. Since 1994, these facilities have been added to the IWU campus: a \$15 million athletics and recreation center, a \$25 million science center, a \$6.8 million residence hall, a \$5.1 million Center for Liberal Arts, and a \$1.65 million baseball stadium.