

LECTURE SUPPLEMENT FOR INTRODUCTORY AND GENERAL CHEMISTRY

Support for Under-Prepared Students

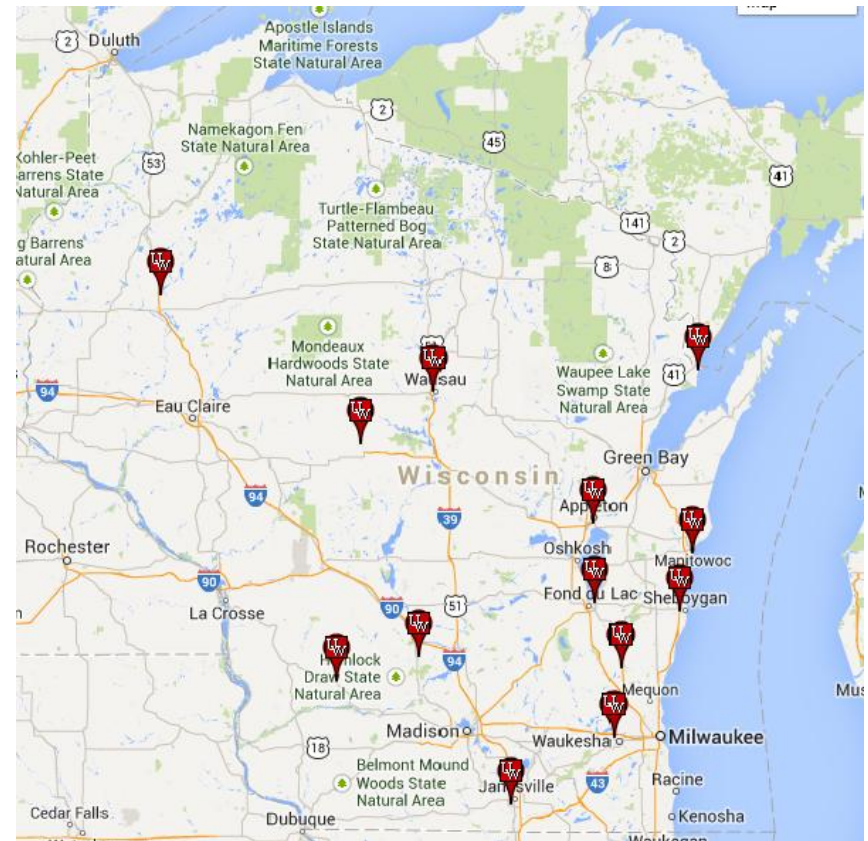
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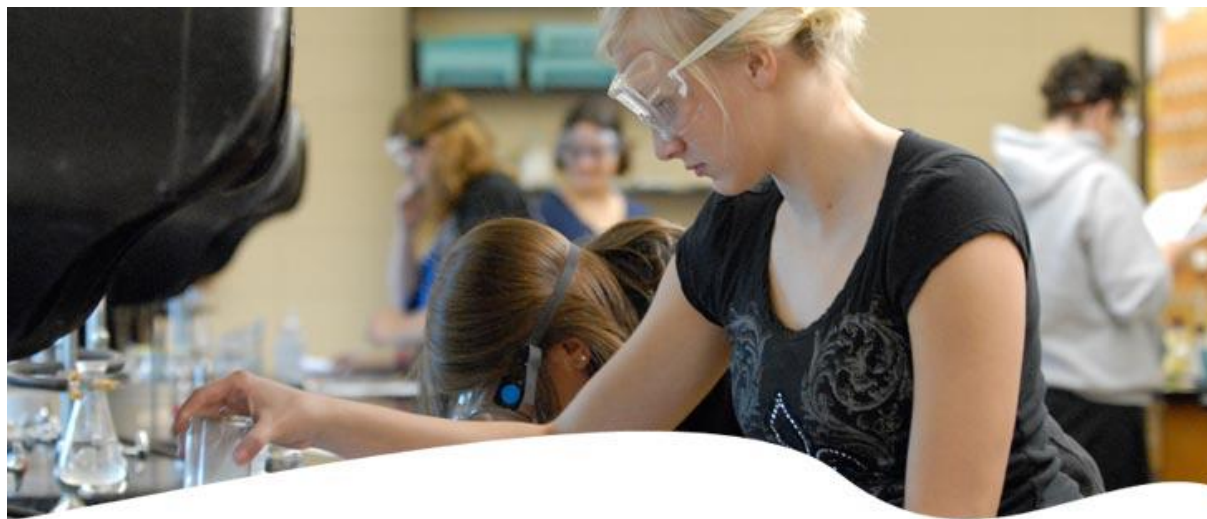
Background: UW Colleges

- Institution of access
 - lowest tuition in UWS
 - 13 campuses and online
 - acceptance rate is 99+%
 - approximately 1/3 of students non-traditional
 - more than 1/3 of students were in the bottom half of their high school class



Background: UW-Marshfield/Wood Cty

- 56% of students at UW-M/WC are first generation college students
- Almost 50% are non-traditional (age 22+)
- Average ACT score: 20.8
- #1 Transfer major area is **Health Sciences**
 - most have Introductory Chemistry (CHE 125) as prerequisite



Underprepared Students: ACT Scores

- ACT “benchmark scores” are set such that a student with that score has a
 - 50% chance of earning a B or better
 - 75-80% chance of earning a C or betterin the corresponding introductory course.¹
- UW Colleges students (2007-2010)²
 - 22-23% achieved benchmark score in Science and
 - 35-37% achieved benchmark score in Math.

¹Allen, J.; Sconing, J. *Using ACT Assessment Scores to Set Benchmarks for College Readiness*. http://www.act.org/research/researchers/reports/pdf/ACT_RR2005-3.pdf (accessed Sept 2012).

²Giordano, J. B. College Readiness Research Workshop. Presented at UW-Marshfield/Wood County, Marshfield, WI, August 2010.

Underprepared Students: Self Reports

- The students indicate they feel unprepared to succeed in a college chemistry course because of:
 - a. never having taken chemistry at the high school level;
 - b. being a non-traditional student who has been out of high school for several (or many) years; and/or
 - c. being a poor math student.
- Many feel that they are at a **disadvantage** compared to their classmates.

The Plan

- Supplemental, one (elective) credit course for students with a weak science background.
- Potential students identified by newly developed chemistry placement exam or math placement exam scores.
- Students encouraged to take the course through their on-campus academic advising.
- Co-enrollment in Introductory or General Chemistry required.

LEC 104: Lecture Supplement

COURSE CATALOG DESCRIPTION

- A lecture-discussion course used to supplement and explore concepts and ideas as designated by the instructor. May be taken up to three times for a maximum of three credits.

DEPARTMENT LEARNING OBJECTIVES FOR THIS COURSE

1. Preparation for *General Chemistry I* or *Introductory Chemistry*
2. Develop an appreciation of the basic principles and ideas in chemistry
3. Proficiency in mathematical and quantitative analysis.
4. Facility in problem-solving methods—including the making and interpretation of graphs and tables.

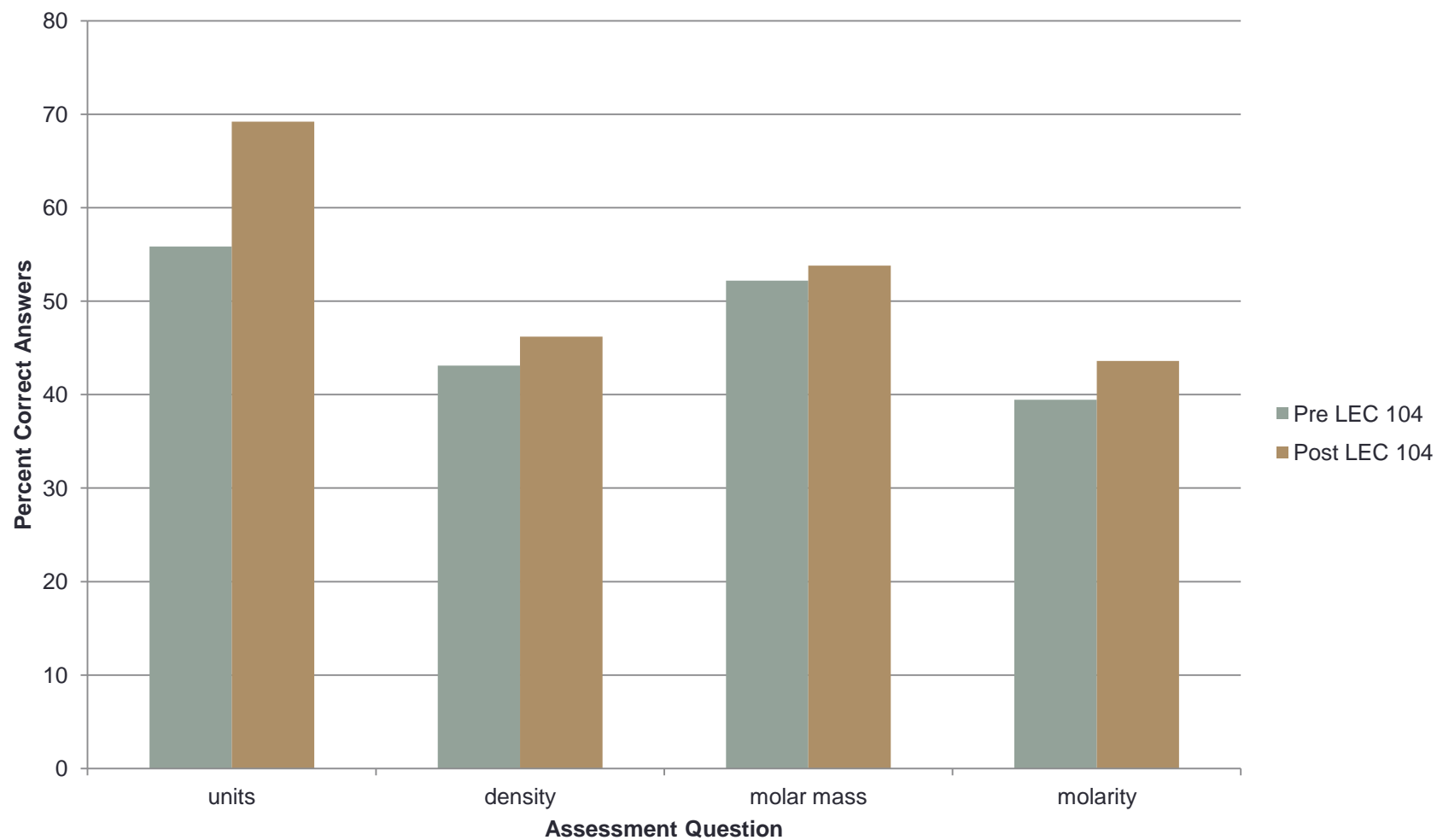
Course Format

- Three 50-minute lectures per week
- First five weeks of the semester
- Mostly POGIL activities
- Topics covered
 1. scientific notation
 2. how to use a scientific calculator
 3. metric system and unit conversions
 4. periodic table
 5. balancing chemical equations
 6. dimensional analysis
 7. basic inorganic nomenclature
 8. moles and molar mass
 9. molarity
 10. tables and graphs

Course Format

- Three 50-minute lectures per week
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- Topics **actually** covered
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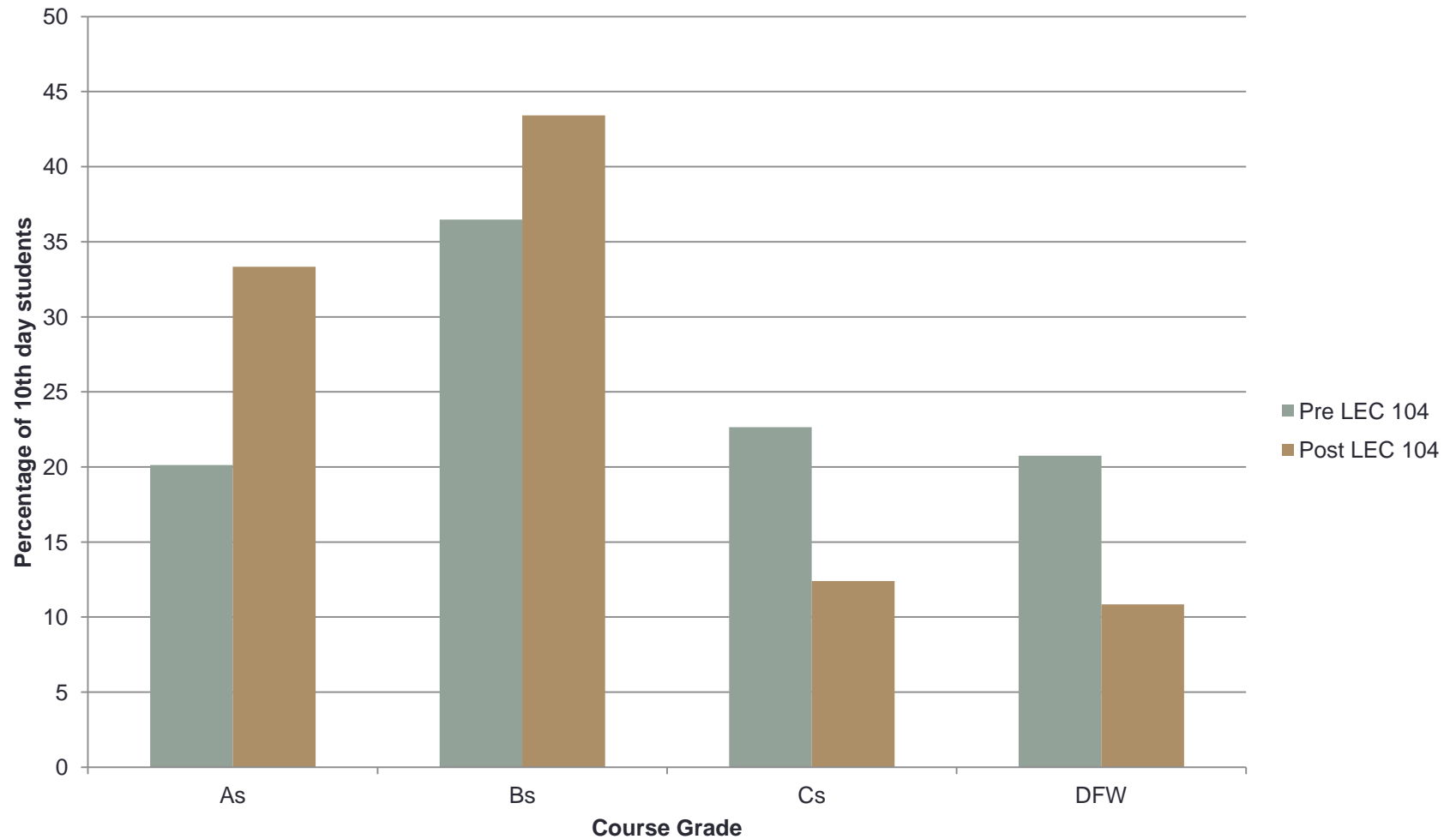
Outcome: Increased Learning



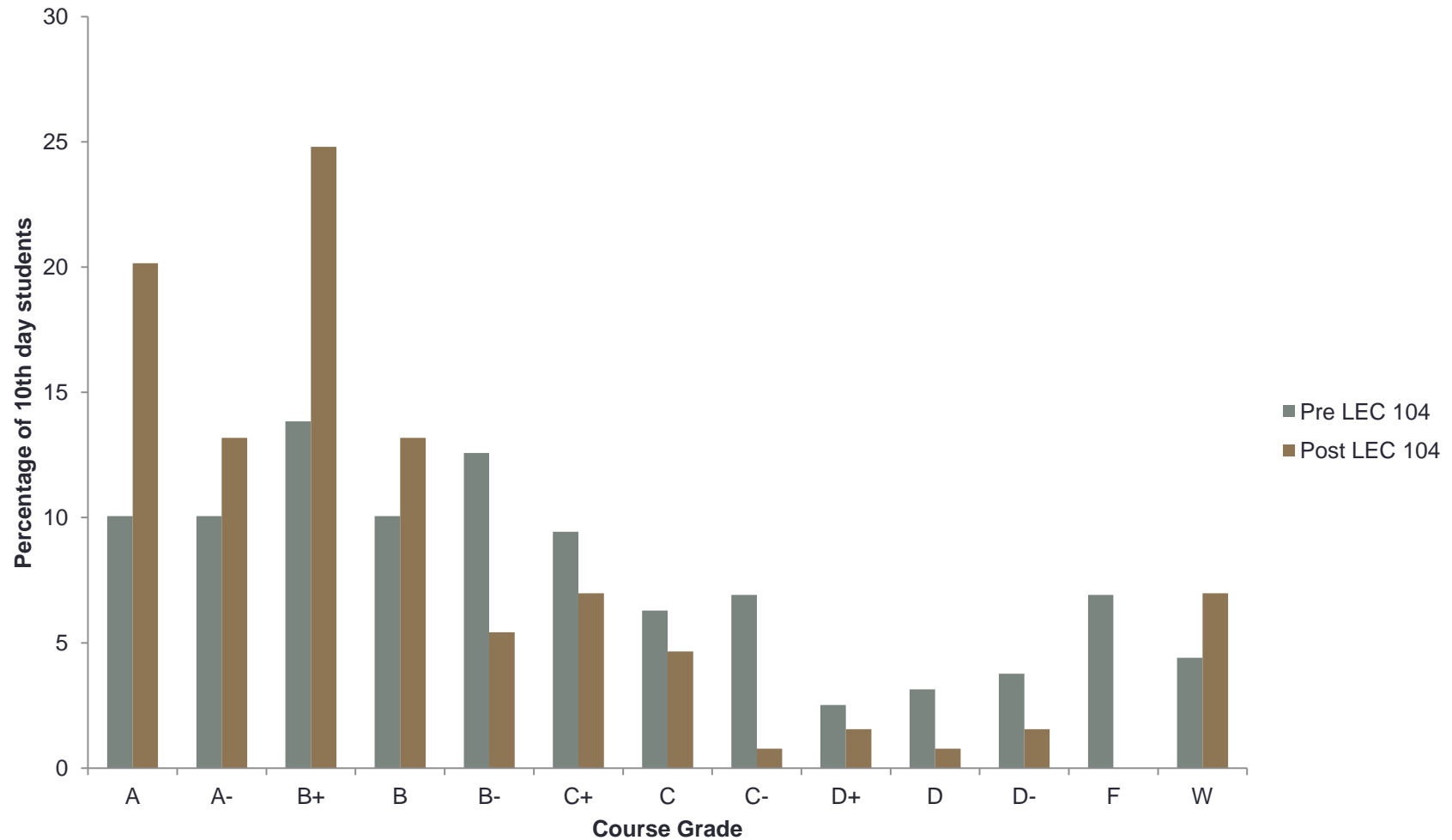
Assessment Questions

- Dimensional Analysis
 - Units: How many mm are in 0.120 m?
 - Density: The density of an aqueous solution of sucrose is $1.15 \text{ g}\cdot\text{cm}^{-3}$. What is the volume of 25.0 g of this solution?
 - Molar mass: What amount of O atoms are present in 22 g of N_2O ?
 - Molarity: What is the molarity of a solution prepared by dissolving 0.274 mol HCl in sufficient water to produce 150. mL of solution?

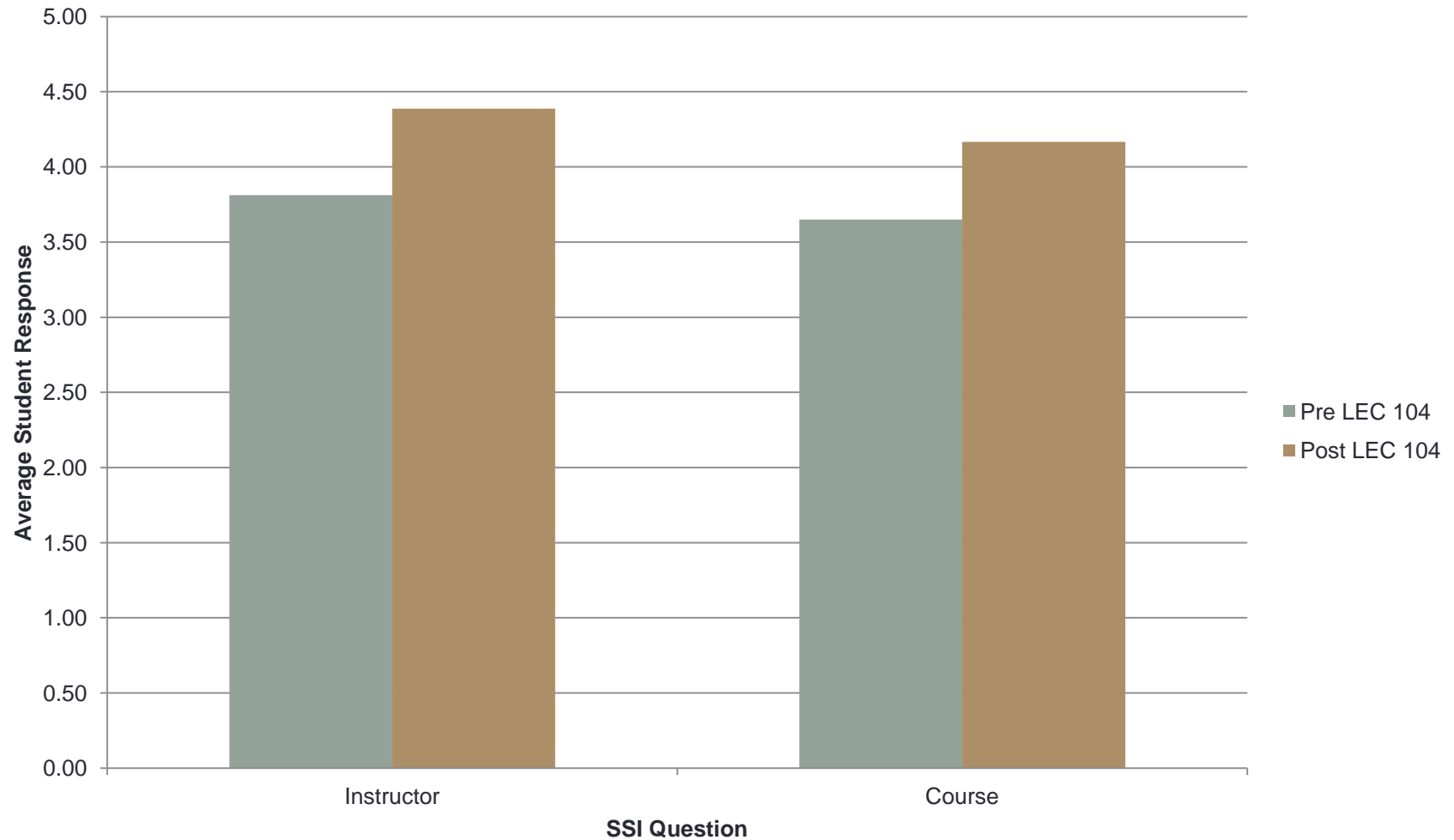
Outcome: Student Grades



Outcome: Student Grades (detailed)



Outcome: Course Satisfaction



Future Directions?

- Change to once a week format?
- Create new course within the Chemistry department?
- Run as a study group facilitated by a tutor?

Acknowledgements

- UW System Women & Science Program
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