

APR Instructional Chemistry 2022-23 Latest Version

Annual program review for Chemistry, reviewing the 2022-23 Academic Year

APR Instructional

Annual Course Student Learning Outcome Data : Version by **Ryland, Sean** on **02/08/2024 22:02**

CSLOs	Expected/Benchmark Performance	Actual Performance (Aggregate of All Terms)
CHM100 - Introduction to General Chemistry		
1. Analyze the fundamental features of chemistry including measurement, mathematical conversion of measured physical properties such as mass, volume, density, pressure, temperature, solutions, concentrations and dilutions. (Active from Fall 2015)	70.00%	95.35%
2. Demonstrate knowledge of the qualitative features of chemistry including physical and chemical properties, naming and writing chemical formulas of compounds and evaluating chemical reactions. (Active from Fall 2015)	70.00%	93.02%
3. Differentiate typical acid and base formulas and compare/contrast the behavior associated with acids and bases. (Active from Fall 2015)	70.00%	88.37%
4. Analyze chemical reactions to quantitatively determine theoretical yield. (Active from Fall 2015)	70.00%	90.70%
CHM101 - General Chemistry I		
1. Apply mathematical skills and demonstrate quantitative problem-solving abilities. (Active from Fall 2015)	70.00%	100.00%
2. Acquire knowledge of basic chemical concepts and develop an understanding of chemistry in preparation for higher-level courses. (Active from Fall 2015)	70.00%	100.00%
3. Attain competency in basic laboratory skills, including lab safety, preparing solutions, taking chemical measurements, and data analysis. (Active from Fall 2015)	70.00%	100.00%
CHM102 - General Chemistry II		
1. Apply mathematical skills and demonstrate quantitative problem-solving abilities. (Active from Fall 2015)	70.00%	90.91%
2. Acquire knowledge of basic chemical concepts and develop an understanding of chemistry in preparation for higher-level courses. (Active from Fall 2015)	70.00%	90.91%
3. Attain competency in basic laboratory skills, including lab safety, preparing solutions, taking chemical measurements, and data analysis. (Active from Fall 2015)	70.00%	90.91%
CHM103 - General Chemistry III		
Per the American Chemical Society: (Active from Fall 2018)	70.00%	0.00%
1. Apply mathematical skills and demonstrate quantitative problem-solving abilities. (Active from Fall 2015)	70.00%	100.00%
2. Acquire knowledge of basic chemical concepts and develop an understanding of chemistry in preparation for higher-level courses. (Active from Fall 2015)	70.00%	100.00%
3. Attain competency in basic laboratory skills, including lab safety, preparing solutions, taking chemical measurements, and data analysis. (Active from Fall 2015)	70.00%	100.00%
CHM118 - Introduction to Organic and Biological Chemistry		
1. Draw and name structures containing common mono-functional organic molecules and differentiate functional groups when they appear in an organic structure, relate the physical and chemical properties of compounds containing these groups with the structure of each functional classification. (Active from Fall 2022)	70.00%	87.50%

CSLOs	Expected/Benchmark Performance	Actual Performance (Aggregate of All Terms)
2. Distinguish roles of four major classes of bio-molecules in living cells. (Active from Fall 2022)	70.00%	87.50%
3. Compare and contrast the processes of DNA replication and transcription, RNA translation, and common types of mutations. (Active from Fall 2022)	70.00%	87.50%
4. Demonstrate knowledge of major biochemical components in metabolism. (Active from Fall 2022)	70.00%	87.50%
CHM221 - Organic Chemistry I		
1. Apply an understanding of functional group reactivity to predict the product of an organic reaction. (Active from Summer 2019)	70.00%	100.00%
2. Understand how various structural features of an organic compound may influence its reactivity. (Active from Summer 2019)	70.00%	100.00%
3. Utilizing theories that explain thermodynamic and/or kinetic stability, predict the relative reactivity of organic compounds with similar molecular structure and/or functional groups. (Active from Summer 2019)	70.00%	100.00%
4. Evaluate the stereochemistry of an organic compound. (Active from Summer 2019)	70.00%	100.00%
CHM222 - Organic Chemistry II		
1. Construct logical multi-step syntheses for organic molecules. (Active from Summer 2019)	70.00%	100.00%
2. Use Molecular Orbital theory and Resonance to explain reactions of benzene and other molecules with conjugated δ systems. (Active from Summer 2019)	70.00%	100.00%
3. Increase breadth of knowledge of organic reactions to include functional groups containing oxygen, benzene and more complex δ systems. (Active from Summer 2019)	70.00%	100.00%
4. Construct molecular structures of increasingly complex molecules from experimental data, including IR, NMR, and Mass Spectrometry. (Active from Summer 2019)	70.00%	100.00%
CHM223 - Organic Chemistry III		
1. Apply the principles of thermodynamics, kinetics, and equilibrium to organic molecules. (Active from Summer 2019)	70.00%	100.00%
2. Conduct spectroscopic analysis and identify structures of organic molecules. (Active from Summer 2019)	70.00%	100.00%
3. Propose the mechanism of a chemical transformation using curved-arrow formalism that is consistent with known kinetic data. (Active from Summer 2019)	70.00%	100.00%
4. Design logical syntheses and structural modifications of biologically important molecules. (Active from Summer 2019)	70.00%	100.00%
CHM118L - Introduction to Organic and Biological Chemistry Lab		
1. Draw and name structures containing common mono-functional organic molecules and differentiate functional groups when they appear in an organic structure, relate the physical and chemical properties of compounds containing these groups with the structure of each functional classification (Active from Fall 2022)	70.00%	87.50%
2. Distinguish roles of four major classes of bio-molecules in living cells (Active from Fall 2022)	70.00%	87.50%
3. Compare and contrast the processes of DNA replication and transcription, RNA translation, and common types of mutations (Active from Fall 2022)	70.00%	87.50%
4. Demonstrate knowledge of major biochemical components in metabolism (Active from Fall 2022)	70.00%	87.50%
CHM221L - Organic Chemistry I Lab		

CSLOs	Expected/Benchmark Performance	Actual Performance (Aggregate of All Terms)
1. Interpret experimental data through application of theoretical models. (Active from Summer 2019)	70.00%	100.00%
2. Safely handle organic chemicals. (Active from Summer 2019)	70.00%	100.00%
3. Gain skill with common synthetic chemistry techniques. (Active from Summer 2019)	70.00%	100.00%
CHM222L - Organic Chemistry II Lab		
1. Interpret experimental data through application of theoretical models (Active from Summer 2019)	70.00%	100.00%
2. Safely handle Organic Chemicals (Active from Summer 2019)	70.00%	100.00%
3. Gain skill with common synthetic chemistry techniques (Active from Summer 2019)	70.00%	100.00%
4. Understand the rationale and need for each step in a laboratory procedure. (Active from Summer 2019)	70.00%	100.00%
CHM223L - Organic Chemistry III Lab		
1. Interpret experimental data through application of theoretical models. (Active from Summer 2019)	70.00%	0.00%
2. Safely handle organic chemicals. (Active from Summer 2019)	70.00%	100.00%
3. Gain skill with common synthetic chemistry techniques. (Active from Summer 2019)	70.00%	100.00%
4. Understand the rationale and need for each step in a laboratory procedure. (Active from Summer 2019)	70.00%	100.00%

APR Questions Tableau : Version by Ryland, Sean on 02/08/2024 22:40

Using the Data Provided (<https://10az.online.tableau.com/#/site/lccc/views/ProgramReview/LTCCProgramReviewSummary?iid=1>) please provide the number of students (headcount) that are served by the discipline.

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Using the Data Provided (<https://10az.online.tableau.com/#/site/lccc/views/ProgramReview/Demographics?iid=1>), identify the populations served by the discipline. Are there any inconsistencies? Does the Population served reflect the population of the college? If not, why, and how can the discipline serve a population more reflective of our community?

Yes. There is a small discrepancy showing Chemistry has 10% more Latinx students than the college as a whole, but that should not be taken seriously as the sample size is too small to be statistically significant.

Using student success data (<https://10az.online.tableau.com/#/site/lccc/views/ProgramReview/SuccessRatesOverall?iid=1>), identify any trends in successful completion of courses.

Are there particular courses (<https://10az.online.tableau.com/#/site/lccc/views/ProgramReview/SuccessRatesbyCourse?iid=1>) students are struggling in?

Are there any demographics that are less likely to complete certain courses in the discipline?

What steps need to be taken to support students and the department in meeting its equity obligations?

In 2022-2023, students struggled in CHM100 and CHM102, likely due to the teaching modality and instructor. That instructor should not be used again and care should be taken to ensure adequate F2F instruction for chemistry courses in the future.

Are there any courses lacking Title V Updates?

If so, how many and why?

(Please check your courses in eLumen for the most recent list of courses that require updates.)

Completing Title 5 updates is an ongoing process, so of course there are some courses that are coming up for revision. The revisions will be submitted on schedule.

Describe the approach to scheduling in terms of offering a balance of Face to Face (F2F) and Online opportunities for students.

We do not offer online chemistry courses due to the requirements for F2F labs. When one instructor was not teaching in the 2022-2023 AY due to a scheduled PDL project, a course was offered in a hybrid modality and it was not successful.

Are there any insights specific to this discipline regarding scheduling modality in terms of success rates, student retention, or course cancellations?

We do not offer online chemistry courses due to the requirements for F2F labs. When one instructor was not teaching in the 2022-2023 AY due to a scheduled PDL project, a course was offered in a hybrid modality and it was not successful.

Are the full-time faculty teaching the courses with the most face to face students? Why/why not?

yes. It is nearly impossible to find PT instructors who meet MQ's to teach F2F in chemistry, so FT faculty are consistently overloaded.

Are staffing levels adequate to fulfill the purpose of the program?

no. See FHP application.

What professional development opportunities have faculty in this discipline taken advantage of? Are there any unmet professional development needs?

Sean Ryland completed a PDL project in the 2022-2023 AY and Carl Franz will be due for a PDL project shortly.

Where applicable, outline and explain any budget shortfalls for this discipline.

Budget has been adequate for instructional supplies.

If additional financial resources are needed, please describe how they will increase student success, retention, or completion.

Additional FT faculty will allow for the expansion of the dual enrollment program at STHS in the future.

Using the SLO Data above, are there any SLOs for any particular courses that students are not successfully understanding? How do you plan to address this?

No.

What are the major strengths of your department?

Student success, especially among students from traditionally underrepresented populations. Active, forward-thinking planning has resulted in the department meeting the needs of students and improving student success.

In what ways could your department improve to better meet the needs of the College and support student success?

Additional FT faculty in the CHM and BIO departments will be required to increase Dual Enrollment offerings at STHS and absorb the additional unit load created by PDL.

What are the biggest challenges your department may face in making these improvements?

Obtaining buy-in from both LTCC and LTUSD.

Identify any other questions, comments, suggestions, or concerns you may have.

No Value

Dean Review : Version by **Williams, Sarah** on **02/13/2024 16:54**

Sarah Williams