Core Course Assessment Plan, 2018-19
Element 6: Natural Sciences

Please complete all sections; do not delete section information. Submit to Pilot when complete.

SECTION 1: GENERAL INFORMATION

Course Dept. Prefix: **CHM** Course #: **1220**

Semester when assessment will occur: ☒ Spring ☐ Summer ☐ Fall Year: 2018 or **2019**

Course Title: **General Chemistry II**

Section Types and number of sections offered in 2018-19. Complete all that apply.

__**X**__ Dayton face-to-face	_____ Lake face-to-face
_____ Dayton online	_____ Lake online
_____ Dayton Honors	_____ Lake Honors

Attributes: ____ Integrative Writing in Core
____ Multicultural Competency in Core
____ Service Learning in Core

Dept. Core Assessment Lead: **David A. Grossie** (Name) **david.grossie@wright.edu** (email)

List at least two assessors; this may include course instructor only if there are multiple sections and multiple instructors of the course. Note - The instructor may not assess his/her students' papers.

- **Rachel Aga**
- **Travis Clark**
- **Lary Sanders**
- _____

SECTION 2: ASSESSMENT PLAN

It is preferable to have the assessment plan for all sections of a course. If not feasible, please complete an assessment plan for separate sections.

Course Outcomes. _____ Check here if Outcomes have been modified.

The course must address all 5 outcomes but must assess a minimum of 1 outcome. Highlight in yellow the outcome(s) you will assess. If you have modified the outcomes, please insert here in place of standard outcomes.

1. Understand the nature of scientific inquiry;
2. Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources;
3. Distinguish between science and technology and recognize their roles in society;
4. Demonstrate an awareness of theoretical, practical, creative and cultural dimensions of scientific inquiry; and

5. Discuss fundamental theories underlying modern science.

Assignments. Select **one** of the options below for assessment of one or more outcomes

☐ Written assignment(s) that addresses/address outcome(s). Include outcome #, title and description for each assignment.

Outcome #: _____ Title:

Description of assignment:

☐ Essay question(s). Provide the question(s) and outcome(s) below.

1. Outcome #: _____ Essay Question: _____
2. Outcome #: _____ Essay Question: _____
3. Outcome #: _____ Essay Question: _____

☐ Pilot asynchronous written discussion that addresses outcome(s). Provide the outcome # and question(s).

1. Outcome #: _____ Discussion Question: _____
2. Outcome #: _____ Discussion Question: _____
3. Outcome #: _____ Discussion Question: _____

☒ Multiple Choice or T/F Marker questions – 3 to 4 questions per outcome. List the outcome and question numbers. A rubric is not used for Marker questions. "All the above" should not be used as the correct answer more than once. **Courses that are IW or SRV/SRVI must use written assignments for those attributes**. Complete the benchmark: We expect **70%** of students to answer **50%** of the question(s) correctly.

1. Outcome #: **2**
    a) Question: ACS General Chemistry Second Term Exam, Yellow Form 2010, Question #10
    b) Question: ACS General Chemistry Second Term Exam, Yellow Form 2010, Question #18
    c) Question: ACS General Chemistry Second Term Exam, Yellow Form 2010, Question #34
    d) Question: ACS General Chemistry Second Term Exam, Yellow Form 2010, Question #63
2. Outcome #: _____
    a) Question: _____
    b) Question: _____
    c) Question: _____
    d) Question: _____
3. Outcome #: _____
    a) Question: _____
    b) Question: _____
    c) Question: _____
    d) Question: _____

Collecting and submitting the student assignment(s)

____ Will upload assignment(s) to Pilot _____ Will give access to assignment(s) on Pilot

Other: **will sent anonymized score information or data via email**

Rubric Selection (A, B). Select the items you feel best match your assignment(s) in the rubric(s) on the next pages. Please highlight in yellow. **If this course has an IW attribute, please also see section B.**

A. Element 6 Rubric. Select the item(s) you will use in your rubric by highlighting in yellow the item(s). You may select one or more of them. As there is overlap, **choose the items that best fit the assignment you select for assessment.** The items below are taken from the Association of American Colleges and Universities (AACU) Value Rubrics for Critical Thinking and Inquiry and Analysis.

IF YOU ARE USING MARKER QUESTIONS FOR THE OUTCOME, DO NOT USE THIS RUBRIC.

Item	Mastery 4	Partial Mastery 3	Progressing 2	Emerging 1
AACU Critical Thinking VALUE Rubric Items				
Explanation of issues	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.
Influence of context and assumptions	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.

Student's position (perspective, thesis/hypothesis)	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
Conclusions and related outcomes (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.
Item	**Mastery** 4	**Partial Mastery** **3**	**Progressing** **2**	**Emerging** **1**
AACU <u>Inquiry and Analysis</u> VALUE Rubric Items				
Topic selection	Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	Identifies a focused and manageable/ doable topic that appropriately addresses relevant aspects of the topic.	Identifies a topic that while manageable/ doable, is too narrowly focused and leaves out relevant aspects of the topic.	Identifies a topic that is far too general and wide-ranging as to be manageable and doable.
Existing Knowledge, Research, and/or Views	Synthesizes in-depth information from relevant sources representing various points of view/ approaches.	Presents in-depth information from relevant sources representing various points of view/ approaches.	Presents information from relevant sources representing limited points of view/ approaches.	Presents information from irrelevant sources representing limited points of view/ approaches.

Design Process	All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant sub disciplines.	Critical elements of the methodology or theoretical framework are appropriately developed, however, more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.
Analysis	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	Organizes evidence to reveal important patterns, differences, or similarities related to focus.	Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.	Lists evidence, but it is not organized and/ or is unrelated to focus.
Conclusions	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical, or unsupportable conclusion from inquiry findings.
Limitations and Implications	Insightfully discusses in detail relevant and supported limitations and implications.	Discusses relevant and supported limitations and implications.	Presents relevant and supported limitations and implications.	Presents limitations and implications, but they are possibly irrelevant and unsupported.

B. If this is an IW course, you will use the items on this page. You may select one or more of them. Please highlight in yellow.

Item	Mastery 4	Partial Mastery 3	Progressing 2	Emerging 1
Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
Content Development	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation	Attempts to use a consistent system for basic organization and presentation.
Sources and Evidence	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
Control of Syntax and Mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

SECTION 3: UCRC COMMITTEE REVIEW ONLY. DO NOT delete this section.

Item	Complete / NA / Revision Requested	Comments
Learning Outcomes for Element 6 Natural Science	**Complete**	
Assignments matched to Element 6 LOs	**Complete**	
Rubric for LOs	**N/A**	
Rubric for IW Attribute	**N/A**	
Assigned Approved Reviewers	**Complete**	

Committee Review Completed ☐

Committee Chair Signature ___ Dr. Ann M. Bowling _____ Date __December 2018_____

Note: Report Template will be added to each of the individualized assessment plans to facilitate having one final document (assessment and report) for each course.

SECTION 4: ASSESSMENT REPORT DUE May 7, 2021

A separate report needs to be submitted for each assessment plan approved by the Undergraduate Core Oversight Committee (UCOC).

Please upload this entire document to the Pilot course called Element 5 Core Course Assessment 2020-21 (continuous year) by Friday, May 7, 2021. The Final Report Dropbox link can be accessed via Content > Dropbox (Plans, Reports) > Final Report Dropbox.

Date Report Submitted: May 7, 2021

Element: Core Element 6 – Natural Science

Academic Year: Element 6 – 2019-2020

Course and Sections Assessed: CHM 1220-01 (Fall 2019)

Describe the final assessment plan that was implemented and explain any changes made to the approved plan.

I. Core Learning Outcomes Assessed (list):

The following core learning outcome was assessed:
Critically apply knowledge of scientific theory and methods of inquiry to evaluate information from a variety of sources.

II. Procedures Used for Assessment

For **each** learning outcome addressed by this report, state where and when data were collected (in a course, exam, or performance) and how they were evaluated (e.g. rubric, rating scale, key questions from exams, etc.). Specify the course or courses where students demonstrated the outcomes (if applicable) and the assignment(s) that you used for assessment purposes (e.g., capstone project, final examination, research paper, student presentation, performance, portfolio, etc.).

Data were collected from the final exam, where the students were given a standardized American Chemical Society (ACS) exam. Four multiple choice questions from the ACS General Chemistry Second Term 2010 were used for assessment of the learning outcome. This was the approved assessment plan. Student answers were collected for the four questions and the number of correct answers out of the four were tabulated.

III. Summary of Assessment Results:

What did you find from your assessments? (Present and analyze the results from the Aqua system analysis by Vice Provost Tammy Kahrig and/or your departmental review of marker questions.) What did your data reveal about how well students are achieving the Core Learning Outcomes that you listed above? After analyzing your data, present a summary of the data, clearly indicating what any numbers represent (e.g. percentages? means? medians?). Please number each corresponding assessment, summary, and analysis.

On the assessment plan, the benchmark set is that 70% of students are expected to answer 50% of the four approved questions correctly. In Fall 2019, 51 students took the ACS exam and 47 of them answered 50% or more correctly. This corresponds to 92% of the students, meeting the benchmark of 70%.

Benchmark Met ☑ Yes or ☐ No

If not met, please identify conditions (if any) that may have impacted these findings.

IV. ACTIONS TAKEN/PLANNED TO IMPROVE STUDENT LEARNING

Describe how you shared the results with instructors of the courses, the department curriculum committee and chair, Lake campus, and other stakeholders. Explain briefly how department faculty will make improvements based upon the assessment findings (e.g. plans to gather more information; recommending changes to the learning outcomes or assessment procedures; changes in course content, instructional approaches, technology, order of course offerings, materials, resources, assignments, policies, funding, advising, planning, training for adjuncts, etc.).

The results far exceeded the benchmark set, demonstrating effective student learning. This report will be emailed to instructors in CHM 1220, the department chair, and the chemistry undergraduate studies committee.

V. Assessment Administration Feedback

The assessment of the courses was part of the Core assessment cycle. The assessment plan was reviewed and approved by the UCOC. The UCOC provided a presentation on tools available to assist with the assessment, including Watermark Aqua.

Please describe any changes you recommend about the oversight of the assessment process by the UCOC and the Academic Affairs office.

UCOC Report Review

Item	Complete/NA	Revision Requested	Comments
Identified Outcome Assessed	**XX**		
Identified Procedure for Assessment	**XX**		
Summary of Results	**XX**		
Results Shared with Instructor, Dept Curriculum Committee, etc.	**XX**		
Plan for Improvements	**XX**		

Committee Review Completed XXX

Committee Chair Signature ___ Dr. Ann M. Bowling _____ Date __2/11/2022_____