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| **Assurance of Student Learning Report****2022-2023** |
| *Ogden College of Science and Engineering* | *Department of Earth, Environmental, and Atmospheric Sciences* |
| *Geological Sciences #5008* |
| *M. Royhan Gani* |
| ***Is this an online program***? [ ]  Yes [x]  No | Please make sure the Program Learning Outcomes listed match those in CourseLeaf. Indicate verification here [x]  Yes, they match! (If they don’t match, explain on this page under **Assessment Cycle)** |

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| ***Use this page to list learning outcomes, measurements, and summarize results for your program. Detailed information must be completed in the subsequent pages. Add more Outcomes as needed.*** |
| **Program Student Learning Outcome 1:**  Students will be able to apply fundamental geological principles in solving problems. |
| **Instrument 1** | Assurance of Student Learning (ASL) exam administered in the capstone GEOL 499 course (Professional Preparation). |
| **Based on your results, check whether the program met the goal Student Learning Outcome 1.** | **[x]  Met** | **[ ]  Not Met** |
| **Program Student Learning Outcome 2:** Students will recognize and articulate the integrative nature and deep-time connection of various earth system components, including lithosphere, hydrosphere, atmosphere, and biosphere. |
| **Instrument 1** | Assurance of Student Learning (ASL) exam administered in the capstone GEOL 499 course (Professional Preparation). |
| **Based on your results, check whether the program met the goal Student Learning Outcome 2.** | **[x]  Met** | **[ ]  Not Met** |
| **Program Student Learning Outcome 3:** Students will be able to demonstrate an understanding of current societal issues related to earth science. |
| **Instrument 1** | Assurance of Student Learning (ASL) exam administered in the capstone GEOL 499 course (Professional Preparation). |
| **Based on your results, check whether the program met the goal Student Learning Outcome 3.** | **[x]  Met** | **[ ]  Not Met** |
| **Assessment Cycle Plan:**  |
| Overall goals were met for all three SLOs, which indicates a successful third-year implementation of the ASL exam developed by the faculty of the Geological Sciences program. As with all new assessments, there will likely be adjustments and reevaluation as more data is collected in future years. This year, we changed our curriculum to combine GEOL 330 (Mineralogy) and GEOL 350 (Petrology) into one course because of the loss of a faculty who used to teach these courses. Thus, for the next assessment cycle, we plan to modify questions related to Mineralogy and Petrology. ASL exam data suggest that students struggled in Mineralogy. The assessment will be used again for AY 23-24. As COVID-19 pandemic just ended, we plan to set higher targets and/or criteria for student success next year. Average scores for individual courses will also be analyzed for quality control. Re-evaluation, if necessary, will occur as more data is collected.  |

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| **Program Student Learning Outcome 1** |
| **Program Student Learning Outcome**  | Students will be able to apply fundamental geological principles in solving problems. |
| **Measurement Instrument 1**  | Direct measurement: During the final senior year, all graduating students are required to take the capstone GEOL 499 Professional Preparation course. In this course, students take a comprehensive ASL exam consisting of a combination of short-answer and multiple-choice questions, 30 in total. This exam, which is NOT part of the course grading, is designed specifically to assess the three SLOs. In the ASL exam, there are 12 questions related to SLO 1, representing key concepts from the six common-core courses in the Geological Sciences B.S. degree curriculum. |
| **Criteria for Student Success** | A student should score at least 60% on the SLO 1 part of the ASL exam. |
| **Program Success Target for this Measurement** | 70% of students will have scored 60% on the SLO 1 part of the ASL exam. | **Percent of Program Achieving Target** | 78% of students achieved the target.  |
| **Methods**  | GEOL 499 was offered in Fall 2022. All students (N = 9) enrolled in the course took the ASL exam, which was scored by the instructor of record. |
| **Based on your results, highlight whether the program met the goal Student Learning Outcome 1.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| Last year, the program success target was set at 55% as the COVID-19 pandemic created a difficult environment for our seniors over their final semesters. This year, the target has been increased to 70%. Expectedly, we observed a distinct improvement of the assessment results as the pandemic situation improved. However, students struggled in Mineralogy likely because of the loss of a faculty who used to teach this course. We plan to reassess questions related to Mineralogy and Petrology for the next assessment cycle of AY 23-24.  |

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| **Program Student Learning Outcome 2** |
| **Program Student Learning Outcome**  | Students will recognize and articulate the integrative nature and deep-time connection of various earth system components, including lithosphere, hydrosphere, atmosphere, and biosphere. |
| **Measurement Instrument 1** | Direct measurement: During the final senior year, all graduating students are required to take the capstone GEOL 499 Professional Preparation course. In this course, students take a comprehensive ASL exam consisting of a combination of short-answer and multiple-choice questions, 30 in total. This exam, which is NOT part of the course grading, is designed specifically to assess the three SLOs. In the ASL exam, there are 12 questions related to SLO 2, representing key concepts from the six common-core courses in the Geological Sciences B.S. degree curriculum. |
| **Criteria for Student Success** | A student should score at least 60% on the SLO 2 part of the ASL exam. |
| **Program Success Target for this Measurement** | 70% of students will have scored 60% on the SLO 2 part of the ASL exam. | **Percent of Program Achieving Target** | 100% of students achieved the target.  |
| **Methods**  | GEOL 499 was offered in Fall 2022. All students (N = 9) enrolled in the course took the ASL exam, which was scored by the instructor of record. |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 2.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| Last year, the program success target was set at 55% as the COVID-19 pandemic created a difficult environment for our seniors over their final semesters. This year, the target has been increased to 70%. Expectedly, we observed a distinct improvement of the assessment results as the pandemic situation improved. However, students struggled in Mineralogy likely because of the loss of a faculty who used to teach this course. We plan to reassess questions related to Mineralogy and Petrology for the next assessment cycle of AY 23-24. |

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| **Program Student Learning Outcome 3** |
| **Program Student Learning Outcome**  | Students will be able to demonstrate an understanding of current societal issues related to earth science. |
| **Measurement Instrument 1** | Direct measurement: During the final senior year, all graduating students are required to take the capstone GEOL 499 Professional Preparation course. In this course, students take a comprehensive ASL exam consisting of a combination of short-answer and multiple-choice questions, 30 in total. This exam, which is NOT part of the course grading, is designed specifically to assess the three SLOs. In the ASL exam, there are 6 questions related to SLO 3, representing key concepts from the six common-core courses in the Geological Sciences B.S. degree curriculum. |
| **Criteria for Student Success** | A student should score at least 60% on the SLO 3 part of the ASL exam. |
| **Program Success Target for this Measurement** | 70% of students will have scored 60% on the SLO 3 part of the ASL exam. | **Percent of Program Achieving Target** | 78% of students achieved the target.  |
| **Methods**  | GEOL 499 was offered in Fall 2022. All students (N = 9) enrolled in the course took the ASL exam, which was scored by the instructor of record. |
| **Based on your results, circle or highlight whether the program met the goal Student Learning Outcome 3.** | **[x]  Met** | **[ ]  Not Met** |
| **Results, Conclusion, and Plans for Next Assessment Cycle (Describe what worked, what didn’t, and plan going forward)** |
| Last year, the program success target was set at 55% as the COVID-19 pandemic created a difficult environment for our seniors over their final semesters. This year, the target has been increased to 70%. Expectedly, we observed a distinct improvement of the assessment results as the pandemic situation improved. However, students struggled in Petrology likely because of the loss of a faculty who used to teach this course. We plan to reassess questions related to Mineralogy and Petrology for the next assessment cycle of AY 23-24. |

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| **CURRICULUM MAP** |  |  |  |  |
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| **Program name:** | Geological Sciences (#5008) - Geology track |  |  |
| **Department:** | Earth, Environmental, and Atmospheric Sciences |  |  |
| **College:** | Ogden College of Science and Engineering |  |  |
| **Contact person:** | M. Royhan Gani |  |  |
| **Email:** | royhan.gani@wku.edu |  |  |
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| **KEY:** |  |  |  |  |
| **I = Introduced** |  |  |  |  |
| **R = Reinforced/Developed** |  |  |  |  |
| **M = Mastered** |  |  |  |  |
| **A = Assessed** |  |  |  |  |
|  |  |  | **Learning Outcomes** |  |  |
|  |  |  | **LO1:** | **LO2:** | **LO3:** |
|   |  |  | Apply fundamental geological principles in solving problems. | Recognize and articulate the integrative nature and deep-time connection of various earth system components. | Demonstrate an understanding of current societal issues related to earth science. |
| **Course Subject** | **Number** | **Course Title** |   |   |   |
| GEOL | 111 | The Earth | I | I | I |
| GEOL | 112 | Earth’s Past & Future | I | I | I |
| GEOL | 113 | Earth Lab | I | I | I |
| GEOL | 114 | Earth’s Past & Future Lab | I | I | I |
| GEOL | 350 | Mineralogy & Petrology | R/M | R  | R  |
| GEOL | 360 | Sedimentology & Stratigraphy | R/M | R | R |
| GEOL | 380 | Field Technique  | R | R |   |
| GEOL | 408 | Structural Geology  | R/M | R |   |
| GEOL | 499 | Professional Preparation | A | M/A | M/A |
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| **CURRICULUM MAP** |  |  |  |  |
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| **Department:** | Earth, Environmental, and Atmospheric Sciences |  |  |
| **College:** | Ogden College of Science and Engineering |  |  |
| **Contact person:** | M. Royhan Gani |  |  |
| **Email:** | royhan.gani@wku.edu |  |  |
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| **KEY:** |  |  |  |  |
| **I = Introduced** |  |  |  |  |
| **R = Reinforced/Developed** |  |  |  |  |
| **M = Mastered** |  |  |  |  |
| **A = Assessed** |  |  |  |  |
|  |  |  | **Learning Outcomes** |  |  |
|  |  |  | **LO1:** | **LO2:** | **LO3:** |
|   |  |  | Apply fundamental geological principles in solving problems. | Recognize and articulate the integrative nature and deep-time connection of various earth system components. | Demonstrate an understanding of current societal issues related to earth science. |
| **Course Subject** | **Number** | **Course Title** |   |   |   |
| GEOL | 111 | The Earth | I | I | I |
| GEOL | 112 | Earth’s Past & Future | I | I | I |
| GEOL | 113 | Earth Lab | I | I | I |
| GEOL | 114 | Earth’s Past & Future Lab | I | I | I |
| GEOL | 250 | Environmental Geology | I | R | R |
| GEOL | 301 | Earth's Climate in Time | I | R | R |
| GEOL | 310 | Global Hydrology | R |   | R |
| GEOL | 350 | Mineralogy & Petrology | R/M | R  | R |
| GEOL | 360 | Sedimentology & Stratigraphy | R/M | R | R |
| GEOL | 408 | Structural Geology  | R/M | R |   |
| GEOL | 415 | Applied Environmental Geology | R/M | R | R/M |
| GEOL | 420 | Geomorphology | R | R/M | R |
| GEOL | 499 | Professional Preparation | A | M/A | M/A |