



College Report on Quality of Program Learning Outcomes Assessment Spring 2023

College: Science
Assessment Data: 2021-22
APR Report Year: 2022-23

College's UAAC Member: Mark Nielsen

Each 'program of study' completes an annual Student Learning Assessment Report as part of annual program review (APR) in Anthology Planning. 'Program of study' refers to an academic major or credential that has program learning outcomes which students are expected to demonstrate by the time they graduate. Programs report on how well students are achieving these learning outcomes in their annual assessment report.

Meta-assessment is an evaluation of our assessment practice. It is used to help us understand and improve the quality of our assessment at all levels. The process provides feedback to university areas, faculty and staff on our assessment reports. Considerable time and effort is invested in this process which is coordinated by Institutional Assessment and Accreditation.

We use the Quality Assessment Rubric to evaluate assessment reports since 2016, which was adapted from James Madison University's APT Assessment Rubric and produces a quantifiable quality assessment score. This comprehensive rubric aligns with best practices and is used or has been adapted for use at other institutions. Using this standardized rubric provides an opportunity to benchmark our assessment practices and demonstrates our commitment to accountability.

The meta-assessment review is conducted each Spring.

Each program of study receives an individual report of the scored rubric that includes recommendations and links to resources. The purpose of the individual feedback is to support the development of high-quality assessment plans and reports. This is a formative exercise on where and how we might improve our practice.

Data from individual programs of study is aggregated to produce college, institutional, and specialty reports. This college report provides a summary of scores, ratings, rankings, and trend data of its programs. This report helps colleges identify areas that need improvement, as well as exemplar programs.

For 2020-21 assessment data, 368 assessment reports were expected institution-wide. Programs should achieve a minimum rating of "ESTABLISHED," unless they are a new program this year.

Number of Programs Evaluated	Choice Count
2021-22	40

This table shows the number of programs of study for each department.

Department	Choice Count
Biological Sciences	7
Chemistry	6
Physics	5
Math & Stat Sci	12
Earth & Spat Sci	7
Bioinformatics & Comp Biology	3

Number of Programs by Quality Assessment Rating

Rating Category	Choice Count
Beginning	0
Developing	9
Established	9
Mature	9

Number of Non-Compliant Programs

3 Responses



Explanation of Category	Choice Count
<p>DUPLICATE PLAN: This appears to be a duplicate report (or mostly) that was already submitted for another UI program. UI is required to have assessment plans in place that are specific to the major and degree level for all degree programs. The rubric used in this evaluation is based on this assumption being met, and therefore, will not produce a meaningful score. This assessment plan is being recorded as NOT COMPLIANT.</p>	0
<p>REPORT MISSING: This unit's APR was missing a Student Learning Assessment Report for this program of study. UI is required to have an active assessment plan and reporting process, and collects these reports annually. The rubric used in this evaluation is based on this assumption being met, and therefore, will not produce a meaningful score. This assessment plan is being recorded as NOT COMPLIANT.</p>	3

Missing or Invalid Report (Non-Compliant) List

These programs listed below do not meet the minimum requirement to assess at least one program learning outcome each year. Colleges are asked to follow up with each program listed to bring the program into compliance, unless a valid reason is found such as a system error or the program is no longer active. Corrections to the program inventory can be sent to assessment@uidaho.edu to remove programs that are no longer active.

REPORT MISSING: This unit's APR was missing a Student Learning Assessment Report...

Pre-Health Profession Studies (Minor)

REPORT MISSING: This unit's APR was missing a Student Learning Assessment Report...

Groundwater Hydrology (Minor)

REPORT MISSING: This unit's APR was missing a Student Learning Assessment Report...

Statistics (GR Cert)

Programs with Unique Circumstances

Programs listed below are flagged because they have unique circumstances that likely impact their quality score. For example, a new major or degree is expected to have a rating of "beginning" or "developing." Colleges should consider these circumstances when reviewing this report.

NEW MAJOR/DEGREE LEVEL: As this is a new prog...

Climate Change (UG Cert)

Quality Assessment Rubric Summary Results

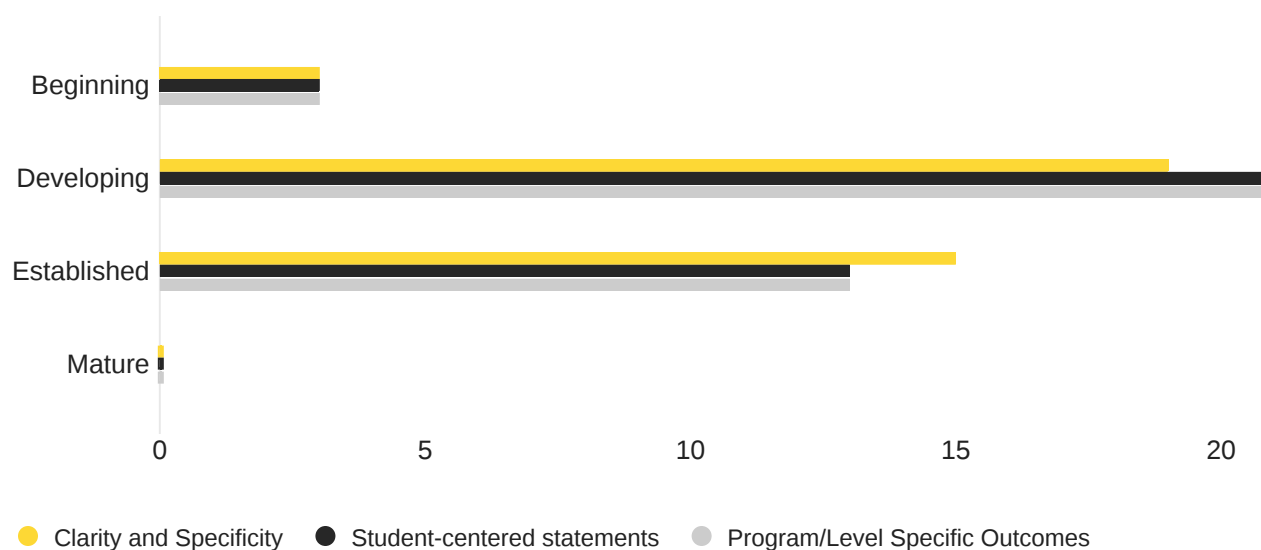
Student Learning Outcomes

This section evaluates the quality of the program's learning outcome statements. The rubric used to evaluate this section is shown below. Programs who were rated non-compliant are not evaluated on this item.

A maximum of 20 points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 – Mature
1. Identifying Measurable and Observable Program-Level Student Learning Outcomes			
Clarity and Specificity			
No student learning outcomes stated; or highly deficit (most programs have 3-5 student learning outcomes or more)	Student learning outcomes present, but written with imprecise verbs (e.g., <i>know, understand</i>), vague description of content/skill or attitudinal domain, and non-specificity of whom should be assessed (e.g., “students”)	Student learning outcomes generally are written using precise verbs, informative descriptions of the content/skill or attitudinal domain, and specifications of whom should be assessed (e.g., “ <i>graduating seniors in the Biology B.A. program.</i> ”)	All student learning outcomes are stated with clarity and specificity using precise verbs, informative description of the content/skill or attitudinal domain, and specification of whom should be assessed (e.g., “ <i>graduating seniors in the Biology B.A. program.</i> ”) SLOs may be aligned with learning standards set by the industry-specific accreditor or professional association.
Student-centered Orientation			
No student learning outcomes are stated in student-centered terms	Some student learning outcomes are stated in student-centered terms	Most student learning outcomes are stated in student-centered terms	All student learning outcomes are stated in student-centered terms (i.e., what a student should know, think, or do)
Program and Level Specific Outcomes			
No student learning outcomes are specific to the program or related industry’s content. Outcomes are very vague or general and could apply easily to any degree program.	Some learning outcomes are specific to the program, but not all. Or, they are all program-specific, but not all are appropriate for the degree level (example: B.A. vs M.S.).	Most or all learning outcomes are program specific and most or all are appropriate for the learning occurring for the degree level.	All learning outcomes are clearly aligned to the content taught within the program and prepare graduates for employment in the related field. They are also appropriate for the degree level, referring to learning occurring during the specified level of study.

37 Responses



Number of Programs Achieving Each Rating

Rating by Attribute	Beginning	Developing	Established	Mature
Clarity and Specificity	3	19	15	0
Student-centered statements	3	21	13	0
Program/Level Specific Outcomes	3	21	13	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation	Responses
Program Learning Outcomes	0.0	15.0	10.6	10.0	4.2	40

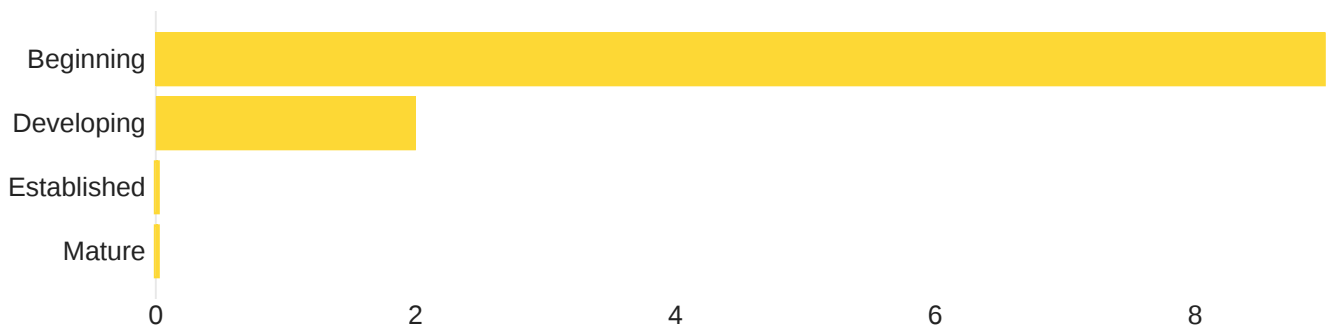
Curriculum Mapping (Bonus)

This section evaluates the quality of the program's curriculum map. The rubric used to evaluate this section is shown below. Historically, our assessment management system has not had a way to track this which is why this score is not calculated in the score used for the overall rating. Many programs have developed curriculum maps institution-wide and our new assessment management system now allows us to track this information. Programs who were rated non-compliant are not evaluated on this item.

A maximum of 20 bonus points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 -- Mature
Mapping the Curriculum			
No activities/courses listed or documentation uploaded, lacks evidence of curriculum alignment	Related activities/courses documented but alignment to student-learning outcomes is absent	Most student learning outcomes have classes or activities aligned to them	All student learning outcomes have classes or activities aligned to them

11 Responses



Number of Programs Achieving Each Rating

Quality Rating	Choice Count
Beginning	9
Developing	2
Established	0
Mature	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation
Curriculum Mapping	0.0	10.0	1.6	0.0	2.8

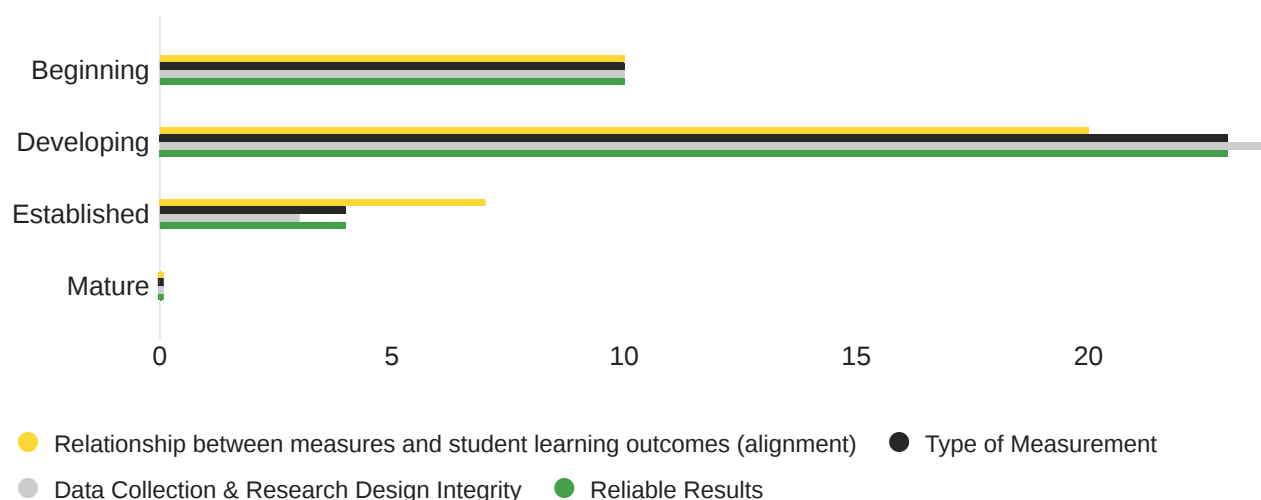
Using Effective Measures for Assessment

This section evaluates the quality of measures used for assessment. Every program learning outcome must be evaluated using at least one direct measure. The rubric used to evaluate this section is shown below. Programs who are rated non-compliant are not evaluated on this item.

A maximum of 20 points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 – Mature
3. Using Effective Measures for Assessment			
A. Relationship between measures and student learning outcomes (alignment)			
No apparent relationship between student learning outcomes and measure indicated for one or more student learning outcomes	At a superficial level, it appears the content assessed by the stated measure matches the student learning outcomes, but no reassuring explanation or detail is given	General detail about how student learning outcomes relate to measures is provided. For example, the faculty wrote test items to match the student learning outcomes, or the instrument was selected “because its general description appeared to match our student learning outcomes”	Detail is provided regarding student learning outcomes and measurement match. For example, specific items on the test are aligned directly with the student learning outcome being assessed. The alignment and direct match are confirmed by faculty subject experts and documented accordingly.
B. Type of Measurement			
No measurement indicated for one or more student learning outcome(s)	Student learning outcomes are not assessed via direct measures (only with indirect measures)	Most student learning outcomes are assessed with direct measures	All student learning outcomes assessed using at least one direct measure (e.g., tests, essays, student work product)
C. Data Collection & Research Design Integrity			
No information is provided about the data collection process or data from direct measures is not collected, without reasonable justification (such as a 3-year cycle or other timeline)	Limited information is provided about data collection such as who and how many took the assessment, but not enough to judge the veracity of the process (e.g., 35 seniors took the test)	Enough information is provided to understand the data collection process, such as description of the sample, testing protocol, testing conditions, and student motivation. Several methodological flaws persist such as under-representative sampling, convenience sampling, or inappropriate test conditions.	The data collection is clearly explained and is appropriate to the specification of desired results (e.g., representative sampling, adequate motivation, two or more trained raters for performance assessment, pre-post design to measure gain, cutoff defended for performance vs. a criterion)
D. Reliable Results			
No process in place to check for inter-rater reliability, nor details provided on effort to improve reliability.	Reliability estimates (e.g., internal consistency, test-retest, inter-rater reliability) provided for more scores, although reliability tends to be poor. Or author states how efforts have been made to improve reliability (e.g., raters were trained on rubric).	Reliability estimates provided for most scores, most scores are marginal or better. Evidence of inter-rater reliability efforts and/or improvement of scores.	Reliability estimates provided and are good. Plus, other evidence of a multi-year process and improvement to inter-rater reliability made.

37 Responses



Number of Programs Achieving Each Rating

Attribute	Beginning	Developing	Established	Mature
Relationship between measures and student learning outcomes (alignment)	10	20	7	0
Type of Measurement	10	23	4	0
Data Collection & Research Design Integrity	10	24	3	0
Reliable Results	10	23	4	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation	Responses
Measures	0.0	15.0	8.6	10.0	3.7	40

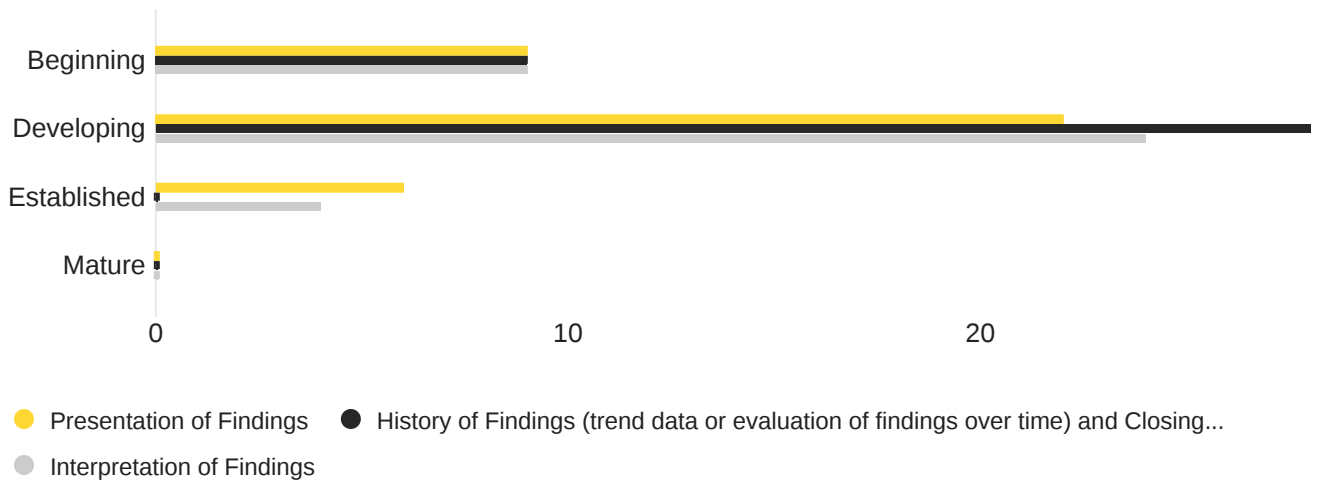
Reporting Program-Level Findings of Assessment

This section evaluates the quality of reporting of assessment results. The rubric used to evaluate this section is shown below. Programs who were rated non-compliant are not evaluated on this item.

A maximum of 20 points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 -- Mature
3. Reporting Program-Level Findings of Assessment			
A. Presentation of findings			
No findings presented for one or more direct measures of student learning outcomes, and no justification for lack of presentation	Findings are present, but it is unclear how they relate to the student learning outcomes or benchmark	Findings are present, and they directly relate to the student learning outcomes and the benchmark but presentation is sloppy or difficult to follow. Statistical analysis may or may not be present.	Findings are present, and they directly relate to the student learning outcomes and benchmark, are clearly presented, and were derived by appropriate statistical analysis.
B. History of findings (trend data or evaluation of findings over time) and closing the loop			
No documented 'closing of the loop' through documented reflection; or no past findings to reflect upon.	Only current year's findings provided or discussed in report; report lacks discussion of trend data.	Past iteration(s) of findings (e.g., last year's) provided for some assessment(s) in addition to current year's.	Past iteration(s) of findings (e.g., last year's) provided for majority of assessments in addition to current year's. Continuous findings allow for evaluating improvement; evidence of supportive and related discussion.
C. Interpretation of findings			
No interpretation attempted for one or more of direct findings reported; or there were no direct findings reported.	Interpretation attempted, but the interpretation does not refer back to the student learning outcomes or benchmark. Or the interpretations are clearly not supported by the methodology or findings.	Interpretations of findings seem to be reasonable inferences given the student learning outcomes, benchmark, and methodology.	Interpretation of findings seem to be reasonable given the student learning outcomes, benchmarks, and methodology. In addition, multiple faculty interpreted findings (not just one person).

37 Responses



Number of Programs Achieving Each Rating

Rating by Attribute	Beginning	Developing	Established	Mature
Presentation of Findings	9	22	6	0
History of Findings (trend data or evaluation of findings over time) and Closing the Loop	9	28	0	0
Interpretation of Findings	9	24	4	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation	Responses
Findings	0.0	13.3	8.5	10.0	3.5	40

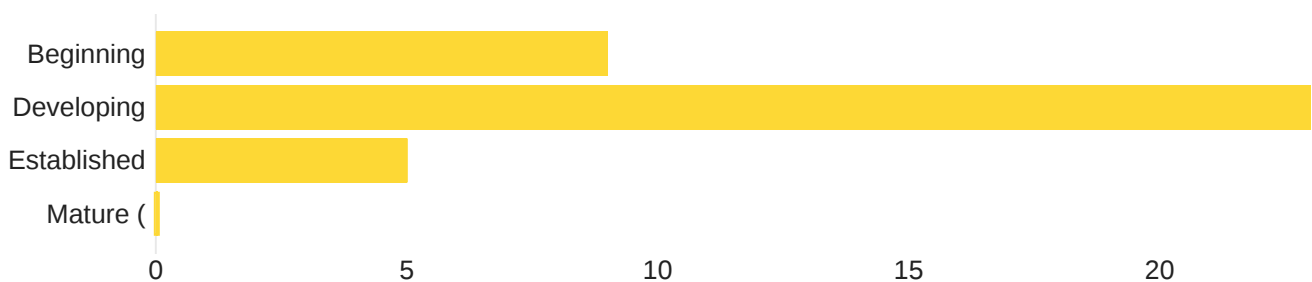
Communicating Assessment Information and Data

This section evaluates whether program learning outcomes and assessment data is shared with constituents, including students and program faculty. The rubric used to evaluate this section is shown below. Programs who were rated non-compliant are not evaluated on this item.

A maximum of 20 points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 -- Mature
5. Communicating Assessment Information and Data			
No evidence of communication documented or discussed	Information provided to limited number of faculty or communication process unclear	Information provided to all faculty, mode (e.g., program meetings, emails) and details of communication clear	Information provided to all faculty, mode and details of communication clear. In addition, information shared with others such as advisory committees and other stakeholders

37 Responses



Number of Programs Achieving Each Rating

Quality Rating	Choice Count
Beginning	9
Developing	23
Established	5
Mature	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation	Responses
Communication	0.0	15.0	8.8	10.0	3.8	40

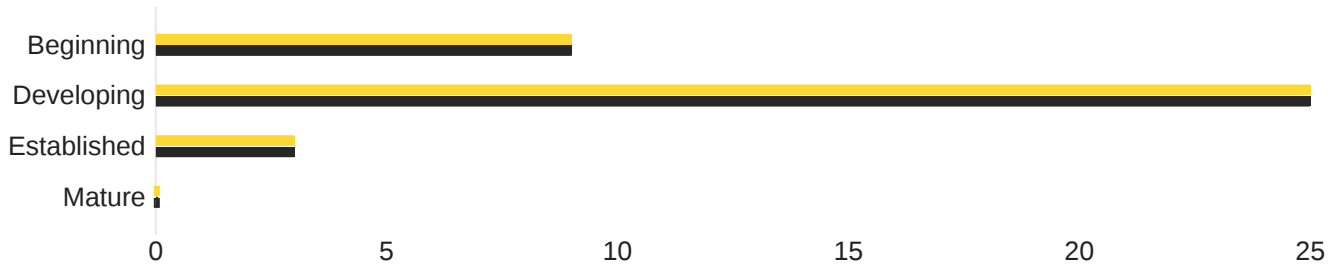
Discussion/Use of Findings

This section evaluates the quality of the report that discusses use of assessment findings to make improvements. The rubric used to evaluate this section is shown below. Programs who were rated non-compliant are not evaluated on this item.

A maximum of 20 points are possible for this section.

1 – Beginning	2 – Developing	3 – Established	4 -- Mature
3. Reporting Program-Level Findings of Assessment			
A. Presentation of findings			
No findings presented for one or more direct measures of student learning outcomes, and no justification for lack of presentation	Findings are present, but it is unclear how they relate to the student learning outcomes or benchmark	Findings are present, and they directly relate to the student learning outcomes and the benchmark but presentation is sloppy or difficult to follow. Statistical analysis may or may not be present.	Findings are present, and they directly relate to the student learning outcomes and benchmark, are clearly presented, and were derived by appropriate statistical analysis.
B. History of findings (trend data or evaluation of findings over time) and closing the loop			
No documented 'closing of the loop' through documented reflection; or no past findings to reflect upon.	Only current year's findings provided or discussed in report; report lacks discussion of trend data.	Past iteration(s) of findings (e.g., last year's) provided for some assessment(s) in addition to current year's.	Past iteration(s) of findings (e.g., last year's) provided for majority of assessments in addition to current year's. Continuous findings allow for evaluating improvement, evidence of supportive and related discussion.
C. Interpretation of findings			
No interpretation attempted for one or more of direct findings reported; or there were no direct findings reported.	Interpretation attempted, but the interpretation does not refer back to the student learning outcomes or benchmark. Or the interpretations are clearly not supported by the methodology or findings.	Interpretations of findings seem to be reasonable inferences given the student learning outcomes, benchmark, and methodology.	Interpretation of findings seem to be reasonable given the student learning outcomes, benchmarks, and methodology. In addition, multiple faculty interpreted findings (not just one person).

37 Responses



- Documented program modification and/or improvements based o findings
- Documented improvement of assessment process

Number of Programs Achieving Each Rating

Attribute	Beginning	Developing	Established	Mature
Documented program modification and/or improvements resulting from assessment findings	9	25	3	0
Documented improvement of assessment process	9	25	3	0

Overall Section Summary	Lowest	Highest	Mean	Median	Standard Deviation	Responses
Continuous Improvement	0.0	13.3	8.5	10.0	3.5	40

College Quality Assessment Results

A summary of the college's overall quality assessment scores is shown below. Colleges can use the mean and median scores to better understand how they are doing as a college. The average score should fall within the "ESTABLISHED" or higher range. Non-compliant programs are not included in these calculations. The summary only includes data for programs that submitted a valid assessment report.

The maximum possible points is 100 points. The college mean is shown below and only reflects programs that submitted a valid assessment report.

Assessment Quality	Lowest	Highest	Mean	Median	Standard Deviation	Responses
College Summary Scores	0.00	73.34	44.94	50.00	17.55	40

College Average Including Non-Compliant Programs

Field	Min	Max	Mean	Standard Deviation	Responses
Score Used for Rating	0.00	73.34	44.94	17.55	40

Beginning	Developing	Established	Mature
1-29	30-65	66-80	81+
Submitted an assessment plan for the program but does not have a fully implemented process; and/or plan is not complete.	Is collecting some data, piloting efforts, engaged in conversations, and/or has operationalized a plan.	Some strategic and comprehensive assessment taking place for one or more learning outcomes. Some areas require further revision, clarification or additional evidence or analysis. Plan may need time to mature further.	Assessment plan fully supported by documentation and findings demonstrate student learning of most outcomes. Faculty are involved, evidence of meaningful analysis is presented, and the process is continuous, and being used to improve student learning and outcomes.

The scale was updated in 2020-21 to better reflect the quality of plans falling in each point range.

Year-to-Year Scores by Program of Study

Trend data, where available, is shown for programs below. Historical data that shows "N/A" means that the program did not submit a valid assessment report that year, or the program was not evaluated for valid reasons. Valid reasons include the program not existing back then or not existing in the assessment system in the past. Scores of "0" indicate a non-compliant assessment report was submitted by the program. Programs who have been active for most of the past decade and submitted valid assessment reports, should have trend data available. In general, programs should show improvement of their quality assessment scores.

Note that no meta-assessment was conducted between 2017-18 and 2020-21 due to the transition and implementation of our new assessment management system.

*In 2015-16, curriculum mapping was counted in the overall rubric score, and a maximum of 120 points were possible. This was moved to a bonus category in 2016-17 because the system did not have a place to capture this information but it was still important to track. Scores for years 2016-17 and later had 100 points maximum possible.

Program of Study	2015-16	2016-17	2017-18	2020-21	2021-22
Biochemistry (B.S.Biochem.)	57.4	67.5	N/A	71.7	55.0
Biology (B.A., B.S.)	65.2	67.5	N/A	69.2	55.0
Biology (M.S.)	46.5	34.7	N/A	43.3	55.0
Biology (Ph.D.)	46.5	34.7	N/A	36.7	64.2
Medical Sciences (B.S.)	N/A	N/A	N/A	N/A	62.9
Microbiology (B.S.Microbiol.)	N/A	N/A	N/A	61.7	56.3
Pre-Health Profession Studies (Minor)	N/A	N/A	N/A	N/A	N/A
Chemistry - Forensics Option (B.S.)	39.5	42.5	36.8	73.8	50.0
Chemistry - Pre-Medical Option (B.S.)	39.5	42.5	36.8	73.8	50.0
Chemistry - Professional Option (B.S.)	39.5	42.5	36.8	73.8	50.0
Chemistry (M.S.)	45.5	39.7	36.8	57.9	50.0
Chemistry (Ph.D.)	50.2	33.7	42.5	53.3	50.0
Chemistry-General Option (B.S.)	39.5	42.5	36.8	73.8	50.0
Physics - Applied Physics Emphasis (B.S.)	N/A	N/A	N/A	85.8	35.0

Program of Study	2015-16	2016-17	2017-18	2020-21	2021-22
Physics - General Physics Emphasis (B.S.)	N/A	N/A	N/A	85.0	35.0
Physics (B.A.)	N/A	N/A	51.51	86.3	35.0
Physics (M.S.)	N/A	N/A	40.67	85.8	50.0
Physics (Ph.D.)	N/A	N/A	43	86.7	60.8
Data Science (GR Cert)	N/A	N/A	N/A	95.0	51.7
Mathematics - Applied - Computation Option (B.S.)	N/A	N/A	N/A	N/A	50.0
Mathematics - Applied - Mathematical Biology Option (B.S.)	N/A	N/A	N/A	N/A	50.0
Mathematics - Applied - Mathematical Biology Option (B.S.)	N/A	N/A	N/A	N/A	50.0
Mathematics - General Option (B.S.)	73.4	67.2	74.3	96.7	50.0
Mathematics (M.A.T.)	52.9	35.2	43.2	58.8	50.0
Mathematics (M.S.)	51.2	40.2	64.7	58.3	50.0
Mathematics (Ph.D.)	N/A	N/A	62	60.8	50.0
Statistical Science (M.S.)	N/A	N/A	74.84	69.6	50.0
Statistics - Actuarial Science and Finance Option (B.S.)	N/A	N/A	N/A	N/A	50.0
Statistics - General Option (B.S.)	N/A	N/A	N/A	96.7	50.0
Statistics (GR Cert)	N/A	N/A	N/A	77.9	N/A
Geog Info Syst (UG Cert)	N/A	N/A	N/A	N/A	25.0
Climate Change (UG Cert)	N/A	N/A	N/A	N/A	25.0
Geography (B.S.)	49.7	48.5	80	35.0	25.0
Geological Sciences - Environmental Hydrogeology Option (BS)	49.7	48.5	80	50.0	30.0
Geological Sciences - Geological Education Option (BS)	N/A	N/A	N/A	N/A	30.0
Geological Sciences - Physical Geology Option (BS)	49.7	48.5	80	50.0	30.0

Program of Study	2015-16	2016-17	2017-18	2020-21	2021-22
Groundwater Hydrology (Minor)	N/A	N/A	N/A	N/A	N/A
Bioinformatics & Comptnl Biol (GR Cert)	43.5	36	N/A	41.7	70.0
Bioinformatics & Comptnl Biol (M.S.)	50.9	49.4	58.005	68.8	73.3
Bioinformatics & Comptnl Biol (Ph.D.)	50.9	49.4	56.338	72.5	73.3

Overall Quality Assessment Rating Achieved

Academic Program (of study)	2021-22 Rating
Geog Info Syst (UG Cert)	Beginning
Climate Change (UG Cert)	Beginning
Geography (B.S.)	Beginning
Mathematics - Applied - Mathematical Biology Option (B.S.)	Developing
Physics (M.S.)	Developing
Chemistry - Forensics Option (B.S.)	Developing
Mathematics (M.A.T.)	Developing
Chemistry - Pre-Medical Option (B.S.)	Developing
Mathematics (Ph.D.)	Developing
Geological Sciences - Physical Geology Option (BS)	Developing
Mathematics - General Option (B.S.)	Developing
Chemistry (Ph.D.)	Developing
Statistics - Actuarial Science and Finance Option (B.S.)	Developing
Physics (B.A.)	Developing
Chemistry (M.S.)	Developing
Biochemistry (B.S.Biochem.)	Developing
Statistical Science (M.S.)	Developing

Mathematics (M.S.)	Developing
Geological Sciences - Geological Education Option (BS)	Developing
Medical Sciences (B.S.)	Developing
Microbiology (B.S.Microbiol.)	Developing
Biology (B.A., B.S.)	Developing
Geological Sciences - Environmental Hydrogeology Option (BS)	Developing
Physics - Applied Physics Emphasis (B.S.)	Developing
Mathematics - Applied - Computation Option (B.S.)	Developing
Chemistry-General Option (B.S.)	Developing
Biology (Ph.D.)	Developing
Data Science (GR Cert)	Developing
Physics - General Physics Emphasis (B.S.)	Developing
Mathematics - Applied - Mathematical Biology Option (B.S.)	Developing
Biology (M.S.)	Developing
Chemistry - Professional Option (B.S.)	Developing
Physics (Ph.D.)	Developing
Statistics - General Option (B.S.)	Developing
Bioinformatics & Comptnl Biol (GR Cert)	Established
Bioinformatics & Comptnl Biol (M.S.)	Established
Bioinformatics & Comptnl Biol (Ph.D.)	Established
Pre-Health Profession Studies (Minor)	N/A
Groundwater Hydrology (Minor)	N/A
Statistics (GR Cert)	N/A