PROGRAM ASSESSMENT REPORT

East Central University

Program Name: Mathematics

College/School Name: College of Health and Science

Academic Year Assessed: 2020-2021

Assessment Report Requirements:

1. **Program Goals, Student Learning Outcomes (SLO), and Criteria:** At *minimum*, your Program Assessment Plan should have 2 overarching goals and 3 major outcomes derived from the goals that assess the core of your program. Each SLO must have at least 2 criteria and each criterion must have at least one instrument.

2. **Assessment Across Program:** Your SLOs and criteria must assess a majority of your students each year and assess from early in the program to the end.
   - Assessing through the program gives you the ability to identify weak points for improvement.

3. **Instruments:** Attach ALL Instruments listed in your assessment plan in the APPENDIX at the end of the Plan/Report.

4. **Instruments Using Direct/Indirect Measures:** Your Program Assessment Plan should include both direct and indirect measures of learning, with direct measures in the majority.

5. **Validation through External Instruments:** ***If possible***, use an external instrument as a direct measure (e.g., ETS/MFT, ACAT, NCLEX, OSAT) to validate your local direct measures.
   - *The Office of Institutional Effectiveness pays for external testing.*

6. **Analysis of Data by Faculty:** All faculty integral to the Program will meet to discuss and analyze the data at the end of the academic year to determine what the collected data says about the program's performance during the current year and how that new knowledge will translate into proposed actions/changes in the coming year(s).

7. **Completion of Template:** *You are required to complete all sections of this report template*. Follow the directions as written. Contact the Assessment Coordinator before modifying the template to match the specific elements of your program assessment plan.

8. **File Name**: Use the following format to name this file before uploading:
   - Program Name Degree Level Asmt Report AY XXXX-XX
   - e.g., Art BFA Asmt Report AY 2020-21
   - e.g., Ed Leadership MEd Asmt Report AY 2020-2021

9. **Upload to Teams:** Complete your plan/report using the template and upload it to your Team channel. Email your Vice President and the Assessment Coordinator to let them know you have finished. *IF you make further changes to your report in Teams, notify your Vice President and the Assessment Coordinator via email.*

See Glossary of Terms for further explanation:
UGRP_ECU Unit Assessment Team >> General channel >> Files.

Assessment Plan, Data, and Analysis

Mission Statements & Goals

EAST CENTRAL UNIVERSITY MISSION STATEMENT:
We educate and empower students to understand and transform our world.

PROGRAM GOAL(S):
The primary goal of the Program is to prepare students for entry into professions requiring an undergraduate education in mathematics. The intent of the Program is to produce graduates who (a) possess a working knowledge of fundamental mathematical concepts, methods of problem analyses and techniques of problem solving; (b) possess technical writing skills appropriate to upper-level mathematics majors and; (c) possess a working knowledge of sound and current pedagogical techniques for the teaching of mathematics at the secondary level (teacher certification option only).

ASSESSMENT ACROSS THE PROGRAM STATEMENT:
Each year, the mathematics program assesses student learning from the beginning to the end of the program. The early part of the program is assessed via criterion 2.1 and new criterion 3.2, middle of the program is assessed via criteria 3.1 and 3.3 while end of the program is assessed via criteria 1.1, 1.2, 2.2 and 2.3.

EXTERNAL INSTRUMENT AVAILABILITY FOR PROGRAM:
Major Field Test in Mathematics is used for assessment.
OSAT is used for assessment.
PPAT is used for assessment.

STUDENT LEARNING OUTCOME 1:
Student will acquire content knowledge of mathematics which will result in their ability to analyze and solve problems using various methods and techniques learned.

Criterion 1.1: Overall student performance on Educational Testing Service (ETS) Major Field Test (MFT) in Mathematics.

Population/Course: All mathematics program majors enrolled in MATH 4923 Perspectives in Mathematics.

Instrument/Measurement (copy/paste instrument in Appendix): ETS administered Major Field Test (MFT) in Mathematics.

Standard: The departmental mean score should be greater than or equal to one standard deviation below the national mean score.

Data Table 1.1:

Academic Year	Number of Students	ECU Scores Range	ECU Math Program Mean	National Institutional Mean	National Institutional Standard Deviation
2020-2021	5	135-174	149*	155.8	8.4
2019-2020	11	121-165	146	156.2	8.5
2018-2019	8	129-156	146	157.0	9.1
2017-2018	6	132-177	149*	154.8	8.8
2016-2017	10	151-164	155*	154.9	8.8

NOTE: [Add explanation for missing data (ND) in the table]

Analysis Table 1.1:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met for the year.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	The ECU mean this year was 2 points higher than our standard. We were close, but did meet the standard.
3. Discuss possible reasons why the unit performed as it did this year.	We had a small cohort this year, but they scored higher on average than in the past. Also, the national mean has continued to decrease since the introduction of the new test form after 2017.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Our mean score increased a bit this year after being a bit lower than normal the last two years. Hopefully, that indicates some of our efforts to review and synthesize are paying off, but it is still early and the sample size is low.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	No actions or changes are needed here; just continue to monitor.

Criterion 1.2: Student performance on individual Assessment Indicators (sub-disciplines) within the MFT. These are: Calculus; Algebra; Routine; Non-Routine; and Applied.

Population/Course: All mathematics program majors enrolled in MATH 4923 Perspectives in Mathematics.

Instrument/Measurement (copy/paste instrument in Appendix): ETS administered Major Field Test (MFT) in Mathematics.

Standard: The departmental mean score should be greater than or equal to one standard deviation below the national mean score for at least three of the five Assessment Indicators.

Data Table 1.2:

Academic Year	Assessment Indicator	National Institutional Mean	National Institutional Standard Deviation	ECU Math Program Mean
2020-2021	Calculus	31.3	7.6	25*
	Algebra	33.9	6.7	24
	Routine	33.6	7.3	25
	Non-routine	26.5	5.4	28*
	Applied	35.5	6.7	34*
2019-2020	Calculus	31.4	7.7	25*
	Algebra	34.1	6.7	25
	Routine	33.8	7.5	26
	Non-routine	26.8	5.4	20
	Applied	35.7	6.8	31*
2018-2019	Calculus	32.0	8.3	23
	Algebra	34.5	7.2	28*
	Routine	34.6	8.0	23
	Non-routine	26.9	5.4	24*
	Applied	36.0	7.4	34*
2017-2018	Calculus	30.6	7.6	31*
	Algebra	33.1	6.3	26
	Routine	31.1	7.1	29*
	Non-routine	26.2	5.6	22*
	Applied	34.5	6.7	30*
2016-2017	Calculus	30.7	7.5	28*
	Algebra	33.1	6.3	37*
	Routine	31.1	7.2	29*
	Non-routine	26.2	5.7	33*
	Applied	34.7	6.7	32*

NOTE: *ECU mean lies within one standard deviation of the national mean.

Analysis Table 1.2:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	The program mean was within one standard deviation of the national mean in the categories of Calculus, Non-routine, and Applied.
3. Discuss possible reasons why the unit performed as it did this year.	This is clearly related in part to overall higher scores in criteria 1.1. We saw a large jump in the non-routine category, so perhaps we had a better preparation on the more difficult and unusual problems.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Our students typically score well on the applied section, which continues this year. Most of the scores are recently pretty consistent, although non-routine as noted was at its highest since 16-17.

5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	No action or changes required here; continue to monitor.

Criterion 1.3: Student performance on Certification Examination for Oklahoma Educators (CEOE); Oklahoma Subject Area Test (OSAT) Field 11: Advanced Mathematics. This test assesses students in the following areas: Number Properties and Number Sense; Relations, Functions and Algebra; Trigonometry and Calculus; Measurement and Geometry; and Probability, Statistics and Discrete Mathematics.

Population/Course: All mathematics program majors in the Teacher Certification option.

Instrument/Measurement (copy/paste instrument in Appendix): OSAT Field 11: Advanced Mathematics

Standard: The percent of ECU Mathematics Teacher Certification majors passing the test should be greater than or equal to the statewide passing percentage.

Data Table 1.3:

Academic Year	ECU OSAT Exams Taken (number of students)	ECU OSAT Exams Passed	ECU Passing Percentage	Oklahoma Passing Percentage
2020-2021	2 3	2 1	100% 33%	Middle Level/Interm. Math n=28; P=67.9% Advanced Math n=51; P=74.5%
2019-2020	3	2	67%*	64%
2019-2018	ND	ND	ND	ND
2017-2018	3	2	67%*	64%
2016-2017	1	0	0%	42%

Analysis Table 1.3:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	This standard was met and not met for this academic year.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	These students performed well for the Mid-level/Intermediate Mathematics exam but not for the Advanced Mathematics exam. It is difficult to meet the standard with such low values for 'n" each academic year.
3. Discuss possible reasons why the unit performed as it did this year.	The students waited until later in the year to take the exam (while student teaching) and this isn't advisable since they are too busy to study. Other than that issue, I am not sure at this time as to why the 2 students did not pass.

4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	The data is staying around the same pass rates. We are finding that as the state of education in Oklahoma decreases and attitudes surrounding teaching decreases, we have fewer candidates. And often some of the candidates that we get are weaker mathematically. We are not sure why but this does influence the scores.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	We need to work to refresh these candidates on their mathematical competencies from earlier in their coursework. Often our students are transfers and we had no input into their foundational courses upon which this exam is based. A review colloquium during their senior year would be advised.

Criterion 1.4: Performance of students on a statistical report produced in MATH 3583 Applied Statistics

Population/Course: All mathematics Applied/Pre-Actuary program majors enrolled in MATH 3583 Applied Statistics.

Instrument/Measurement (copy/paste instrument in Appendix): As part of the course, students prepare a statistical report using real world data which implements at least two of the statistical procedures learned in the course. The professor teaching the course scores these reports for assessment purposes using a standard departmental rubric.

Standard: At least 80% of the students should score 70% or higher.

Data Table 1.4:

Academic Year	Number of Students	Number of Students Scoring 70% or Above	Passing Percentage
2020-2021	3	2	67%
2019-2020	ND	ND	ND
2018-2019	ND	ND	ND

NOTE: Assessment was not administered before 2020-2021 due to being developed prior.

Analysis Table 1.4:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was not met for this year
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	With only 3 students in this population, we would have needed 100% to meet the standard.
3. Discuss possible reasons why the unit performed as it did this year.	The student who did not score greater than 70% actually did not turn the assignment in at all. The average score of the two that actually turned in the assignment was high, 89%.

4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	This is the first semester we have had this rubric and offered the class, so we can't look back at this.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	We should add Data Science Applications majors to the population, since that new concentration will also take this class. Because of small numbers we should change this criterion to be based on the average score on the rubric.

STUDENT LEARNING OUTCOME 2: Student will acquire oral and written communication skills appropriate to upper level mathematics majors.

Criterion 2.1: Written Communication Skills - Performance of students on writing rigorous, formal mathematical proofs in MATH 3813 Modern Algebra, MATH 3213 College Geometry and MATH 4133 Intermediate Analysis.

Population/Course: All mathematics program majors in the Teacher Certification option and the General option.

Instrument/Measurement (copy/paste instrument in Appendix): A department portfolio containing written mathematical proofs from all students enrolled in MATH 3813 Modern Algebra, MATH 3213 College Geometry and MATH 4133 Intermediate Analysis. These proofs are evaluated by a committee of up to three department faculty not currently teaching the courses.

Standard: At least 90% of the students should score 70% or higher.

Data Table 2.1:

Academic Year	Number of Students	Proof Skills Above 70%	Communication Skills Above 70%
2020-2021	8	100%	87.5%
2019-2020	ND	ND	ND
2018-2019	13	92%	38%
2017-2018	3	33.33%	66.67%
2016-2017	6	67%	100%

NOTE: For 2019-2020, no data due to covid19.

Analysis Table 2.1:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met for proof skills and not met for communication skills.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	All 8 students performed adequately on proof skills, exceeding the 90% standard, but only 7 of them performed adequately on communication skills, and so did not quite reach the standard.

3. Discuss possible reasons why the unit performed as it did this year.	With only 8 students, this swing is due to a single student and so it is hard to make a conclusion.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Ignoring the data gap in 2019, it seems like proof skills have taken a rise recently which is encouraging since we have been introducing proofs more throughout the curriculum. Communication seems to fluctuate wildly.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	Since we see small numbers of students, these percentages are too volatile. We should change this criterion to be simply that the average scores on both the proof skills and communication skills are at least 3.

Criterion 2.2: Written Communication Skills - Performance of students on writing mathematical research paper in MATH 4923 Perspectives in Mathematics.

Population/Course: All mathematics program majors.

Instrument/Measurement (copy/paste instrument in Appendix): Written research paper submitted by all students in MATH 4923 Perspectives in Mathematics and evaluated by course instructor.

Standard: At least 80% of the students should score 75% or higher.

Data Table:

Academic Year	Number of Students	Students Scoring Higher than 75%	Percentage
2020-2021	5	4	80%
2019-2020	11	8	73%
2018-2019	7	5	71%
2017-2018	6	6	100%
2016-2017	10	9	90%

NOTE:

Analysis Table:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	All but 1 of the 5 students met the goal of scoring higher than 75%.
3. Discuss possible reasons why the unit performed as it did this year.	As mentioned above, most students scored at least 75% on the paper. This semester included class time to work on the project and corresponding paper/presentation. Those that used this time wisely benefited.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	With relatively small populations, the percentage of students scoring higher than 75% is easily impacted and students often struggle writing mathematics, as

	can be seen by the changes in increasing and decreasing over the last 5 years. Varying instructors each semester and different progress checks for students during the semester can impact the quality of their paper. For example, whether a draft submission during the semester is required.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	Moving forward, have course instructor collect a draft of research paper during the semester to provide feedback to students.

Criterion 2.3: Oral Communication Skills - Performance of students on presenting research to all mathematics faculty in MATH 4923 Perspectives in Mathematics.

Population/Course: All mathematics program majors.

Instrument/Measurement (copy/paste instrument in Appendix): Research paper presented by all students in MATH 4923 Perspectives in Mathematics and evaluated by all mathematics faculty.

Standard: A minimum of 80% of students should score at least a 75% average on each category of the rubric used to score the presentation.

Data Table 2.3:

Academic Year	Category	Number of Students	Students Scoring Higher Than 75%	Percentage
2020-2021	Organization/Preparation	5	5	100%
	Content	5	4	80%
	Presentation	5	5	100%
2019–2020	Organization/Preparation	11	9	82%
	Content	11	8	73%
	Presentation	11	9	82%
2018–2019	Organization/Preparation	6	6	100%
	Content	6	4	67%
	Presentation	6	6	100%
2017–2018	Organization/Preparation	6	5	83%
	Content	6	5	83%
	Presentation	6	5	83%
2016–2017	Organization/Preparation	10	10	100%
	Content	10	8	80%
	Presentation	10	10	100%

NOTE:

Analysis Table 2.3:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met for this year.

2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	All 5 students scored at least 75% in the organization/preparation and presentation categories. All but one student scored at least 75% in the content category.
3. Discuss possible reasons why the unit performed as it did this year.	Students give a presentation earlier in the semester graded with the same rubric, which gives them a better idea of how to do well in the organization/preparation and presentation categories. It is more challenging for them to present content at an appropriate level and detail.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Small populations mean one student can greatly impact overall percentages. Looking at the last 5 years, we can see that the trend of at most 2 students not meeting the goal of 75% continues.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	No actions or changes needed.

STUDENT LEARNING OUTCOME 3:

Criterion 3.1: Student will acquire ability to apply content knowledge and communication skills from Student Learning Outcomes 1 and 2, respectively. This application will prepare them for effectively teaching secondary-level mathematics, graduate programs, or careers in industry.

Population/Course: All mathematics program majors in the Teacher Certification option.

Instrument/Measurement (copy/paste instrument in Appendix): A portfolio containing lesson plans from all mathematics teacher candidates enrolled in MATH 4915 Methods of Teaching Secondary Mathematics. These plans are evaluated by a committee of up to three department faculty.

Standard: The range of scores for the rubric provided for the fifteen NCTM elements under the umbrella of four NCTM Standards can range from 15 to 45. Starting AY 2016, in order to meet standards, 75% of teacher candidates should score "Acceptable-2" or "Target-3" in their overall ratings thus achieving a cumulative score of 30 to 45 points for Standards and elements for 2, 3, 4, and 6.

Data Table 3.1:

Academic Year	Number of Students	Range of Scores	Number scoring: "Acceptable" or" Target" (range 30-45 points)	Percent Meeting Standard
2020-2021	5	22-41	3	80
2019-2020	ND	ND	ND	ND

2018-2019	9	22-40	8	57
2017-2018	ND	ND	ND	ND
2016-2017	7	21-39	4	89

NOTE: Course only offered in fall of even-numbered years.

Analysis Table 3.1: A response is required for each question in the table.

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	This standard was met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	Three out of the five candidates scored in the 30-45 point range for the instrument thus meeting standards. The other two candidates scored substantially in the "acceptable" category but not enough to meet standards.
3. Discuss possible reasons why the unit performed as it did this year.	Three out of the five candidates met the standard. The two students that did not meet the standard were general mathematics majors that chose to pursue alternative certification after graduation. As such, they did not have the education courses that the other three had and consequently were lacking in pedagogical knowledge. This one semester course was not enough to get them to meet standards.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	The data varies enough that it is hard to recognize patterns at this point. The rubric was changed and then modified in the last 6-year period. Hopefully, moving forward, we can start to see trends as we continue to use this instrument.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	No actions or changes at this time.

Criterion 3.2: Performance of teacher candidates in designing instruction, assessment planning and collection, and implementing and self-evaluating student learning in their own classroom during the student teaching experience.

Population/Course: All mathematics program majors in the Teacher Certification option

Instrument/Measurement (copy/paste instrument in Appendix): PPAT (Praxis Performance Assessment for Teachers) submitted by each teacher candidate at the conclusion of the student teaching experience. The PPAT consists of four tasks completed during the student teaching semester. The Tasks include: Knowledge of Students and the Learning Environment, Assessment and Data Collection to Measure and Inform Student Learning, Designing Instruction for Student Learning, and Implementing and Analyzing Instruction to Promote Student Learning. Task 1 is formative whereas Tasks 2, 3, and 4 are summative. *Locally and Nationally assessed.*

Standard: The percent of ECU Mathematics Teacher Certification majors passing the test should be greater than or equal to the statewide passing percentage.

Data Table 3.2:

Academic Year	Number of Students	ECU PPAT Exams Passed	ECU Math Passing Percentage	Oklahoma Passing Percentage
2020-2021	2	2	100%	???
2019-2020	1	1	100%	90.63
2018-2019	ND	ND	ND	ND
2016-2017	ND	ND	ND	ND

NOTE: The PPAT was not used for assessment at ECU until AY19-20. It is a nationally assessed exam and OEQA adopted it in place of the OPTE in AY20-21 thus solidifying it as a form of assessment for preservice teachers at ECU. Before this time, an internal assessment form was used to assess preservice teachers during their student teaching semester.

Analysis Table 3.2:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	I have not received data on the state pass rate but since all two students passed the PPAT, this standard was fully met.
3. Discuss possible reasons why the unit performed as it did this year.	Student teachers worked with program directors on feedback for Task 1 and minute feedback on other tasks. Additionally, discussion of overall PPAT assessment occurred in seminar course.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Since this assessment is new to ECU and the state of OK, the initial students scored lower than current students. The reasons for this seem to be due to the focus in education courses on writing, assessment, and pedagogical decisions based upon data.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	No actions or changes needed at this time.

Criterion 3.3: Communicating Student Satisfaction – Responses of mathematics majors (freshmen-senior) on the ECU student opinion survey administered by ECU.

Population/Course: All mathematics program majors (freshmen-senior).

Instrument/Measurement (copy/paste instrument in Appendix): ECU student opinion survey completed by mathematics program majors (freshman-senior).

Standard: A minimum of 75% satisfaction should be achieved in each category of the survey.

Data Table 3.3:

Academic Year	Category	Number of Students	Student Number Indicating Satisfaction	Percentage
2020-2021	Advising (Q5.6)	6	5	83%
	Instruction (Q5.8)	6	6	100%
	Classroom (Q5.14)	6	5	83%
	Technology (Q5.16)	6	5	83%
2019–2020	Advising (Q5.6)	12	11	92%
	Instruction (Q5.8)	12	9	75%
	Classroom (Q5.14)	13	10	77%
	Technology (Q5.16)	13	10	77%
2018-2019	ND-2	ND-2	ND-2	ND-2
2017-2018	ND-3	ND-3	ND-3	ND-3
2016-2017	ND-1	ND-1	ND-1	ND-1

Analysis Table 3.3:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	All four questions had over 75% satisfaction (a 4 or 5 as a response).
3. Discuss possible reasons why the unit performed as it did this year.	It is a pretty small sample, but we have to assume this is because the students are generally happy with the facilities and faculty in our department.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	This is only the second year we had data on the current survey and the results are very similar to the previous year.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	We need to reword the standard to make clear exactly what questions we intend to look at for this standard.

Criterion 3.4: Mathematics majors presenting research at national, regional or state research conferences.

Population/Course: All mathematics program majors.

Instrument/Measurement (copy/paste instrument in Appendix): Number of students presenting research each year at conferences.

Standard: At least 25% of all students should present their research.

Data Table 3.4:

Academic Year	Number of Student	Students Presented	Percentage
2020-2021	30	3	10%
2019-2020	36	9	25%
2018-2019	36	7	19%
2017-2018	6	1	17%
2016-2017	10	4	40%

Analysis Table 3.4:

Analysis Question	Analysis Response
1. Was your standard met or not met for the year?	The standard was not met.
2. Whether met or not met, explain how your unit performed in relation to the standard (relate the data in the table to the standard).	Obviously, 10% is substantially lower than the 25% goal.
3. Discuss possible reasons why the unit performed as it did this year.	COVID did affect the availability of conference opportunities and student desire to participate in them which is likely at least partially responsible for the low rate.
4. Look at the 5-year data trends and discuss those. Note if data seem to be increasing/decreasing with time and if so, reasons why.	Remember that the standard shifted in 2018 to include all majors, and so the numbers are different. This recent year looks like an anomaly, being lower than the other two recent years.
5. Using your analysis responses, make specific data-driven decisions about your unit. If no actions or changes are needed, state that. Copy/paste the #5 response to Current Actions and/or Changes (end of template)	We need to reconsider the standard and ensure that it is an appropriate and realistic goal.

Summary Table of Student Learning Outcomes/Criteria/Instruments				
Student Learning Outcomes	**Criteria/Instrument** (modify table to fit your plan)	**Direct/ Indirect Measure**	**Met**	**Not Met**
SLO1: Student will acquire content knowledge of mathematics which will result in their ability to analyze and solve problems using various methods and techniques learned	1.1: Overall student performance on Educational Testing Service (ETS) Major Field Test (MFT) in Mathematics	Direct	X	
	1.2: Student performance on individual Assessment Indicators (sub-disciplines) within the MFT	Direct	X	
	1.3: Student performance on Certification Examination for Oklahoma Educators (CEOE); Oklahoma Subject Area Test (OSAT) Field 11: Advanced Mathematics	Direct	X	X
	1.4 Performance of students on a statistical report produced in MATH 3583 Applied Statistics	Direct		X
SLO2: Student will acquire oral and written communication skills appropriate to upper level mathematics majors	2.1: Written Communication Skills - Performance of students on writing rigorous, formal mathematical proofs in MATH 3813 Modern Algebra, MATH 3213 College Geometry and MATH 4133 Intermediate Analysis.	Direct	X	X
	2.2: Written Communication Skills - Performance of students on writing mathematical research paper in MATH 4923 Perspectives in Mathematics	Direct	X	
	2.3: Oral Communication Skills - Performance of students on presenting research to all mathematics faculty in MATH 4923 Perspectives in Mathematics	Direct	X	
SLO3: Student will acquire ability to apply content knowledge and communication skills from Student Learning Outcomes 1 and 2, respectively. This application will prepare them for effectively teaching secondary-level mathematics, graduate programs, or careers in industry	3.1: Performance of students in the Teacher Certification Option (teacher candidates) on lesson plan portfolio in MATH 4915 Methods of Teaching Secondary Mathematics	Indirect	X	
	3.2: Performance of teacher candidates on PPAT during the student teaching experience	Direct	X	
	3.3: Communicating Student Satisfaction – Responses of mathematics majors (freshmen-senior) on the ECU student opinion survey administered by ECU.	Indirect	X	
	3.4: Mathematics majors presenting research at national, regional or state research conferences.	Direct and Indirect		X

Student Information for this Academic Year	
Total, *unduplicated* number of students assessed this academic year	24
Program census for Fall	30
Program census for Spring	28
Total number of Fall Program graduates	1
Total number of Spring/Summer graduates	2
Mean major GPA of Fall graduates	3.60
Mean major GPA of Spring/Summer graduates	3.44

NOTE: With the exception of the unduplicated number assessed (yellow), student information is provided by Office of Institutional Effectiveness and is made available in your Teams folder. For help with determining unduplicated number, contact the Assessment Coordinator.

Faculty Meeting: List meeting date(s) and a roster of those in attendance.

Item	Dates	Attendees
End-of-Month Meeting (Dept. of Math and CS)	August 2020, September 2020 October 2020 January (14 & 29) 2021 March 2021 May 2021	Mary Harper; Andrew Wells; Nancy McClain; Nicholas Jacob; Michelle Lastrina; Matthew Lynam; Mary Kay Tarver; Vladimir Ufimtsev; Waynette Nell; Jalal Omer; Khem Poudel; Sometimes Dr. Hobbs (adjunct)
Dept. Assessment Committee	January (25 & 28) 2021 February (2, 5, 23, 25) 2021 March (4, 9, 11) 2021 April (29) 2021 May (3) 2021	Mary Harper; Michelle Lastrina *One meeting about corequisite data had the following in attendance: Matthew Lynam; Nancy McClain; Andrew Wells;

Sharing with Stakeholders:

1. Stakeholders for this Program include: [**list** all within and without the ECU community]

2. Current program assessment reports are available on the website of the Office of Institutional Effectiveness:
https://myecu.ecok.edu/ICS/Institutional_Reporting/Assessment_Reporting_and_Outcomes.jnz

This link will change Fall 21 since MyECU is being phased out – I will let you know what to change it to.

SUMMARY OF LAST 5 YEARS' ACTIONS/CHANGES/REVIEWS & UPDATES

For instructions see *Glossary of Terms Pgm Asmt* in Teams.

Academic Year	Summary of Actions/Changes from Report
2020-2021	**ACTION**: New Data Science concentration added to program. **CHANGE**: Assessment Instrument for Criterion SLO 3.2 changed to PPAT. **Criterion 1.3**: We need to work to refresh these candidates on their mathematical competencies from earlier in their coursework. Often our students are transfers and we had no input into their foundational courses upon which this exam is based. A review colloquium during their senior year would be advised. **Criterion 1.4**: We should add Data Science Applications majors to the population, since that new concentration will also take this class. Because of small numbers we should change this criterion to be based on the average score on the rubric. **Criterion 2.1**: Since we see small numbers of students, these percentages are too volatile. We should change this criterion to be simply that the average scores on both the proof skills and communication skills are at least 3 **Criterion 2.2**: Moving forward, have course instructor collect a draft of research paper during the semester to provide feedback to students. **Criterion 3.3**: We need to reword the standard to make clear exactly what questions we intend to look at for this standard. **Criterion 3.4**: We need to reconsider the standard and ensure that it is an appropriate and realistic goal.
2019-2020	**ACTION**: New general education course added to course rotation (MATH 1613 Functions and Modeling). Also, new supplemental courses added to general education courses (MATH 0512 Supplemental College Algebra, MATH 0411 Supplemental Survey of Mathematics, MATH 0221 Supplemental Probability & Statistics, and MATH 0612 Supplemental Functions & Modeling). **ACTION**: New CPSMA course added to the course rotation (CPSMA 4513-Data Applications in Business).
2018-2019	**ACTION**: New course MATH 4223 Introduction to Point Set Topology will not be required by mathematics majors in the general and teacher certification options starting fall 2019. **ACTION**: New course MATH CPSMA 3913 Discrete Mathematics will be required by mathematics majors in the teacher certification option starting fall 2020. CHANGE: New criterion 1.4 added-Performance of students on a statistical report produced in MATH 3583 Applied Statistics to start AY 2021 due to course rotation. **CHANGE**: Criterion 3.4 standard changed from 50% to 25% due to feasibility

2017-2018	**ACTION**: 2hr lab course added to MATH 4913 Methods of Teaching Secondary Mathematics Introduction to Point Set Topology will be required by teacher certification option majors starting fall 2018. The course is now a 5hr course MATH 4915.
2016-2017	**CHANGE:** Criterion 3.1 and its standard will change owing to new reporting of data for mathematics teacher certification majors. **CHANGE:** Criterion 3.2 will be dropped from the assessment of the major for AY 2017 and beyond. This is owing to new reporting of data. See criterion 3.1. **CHANGE:** New Criterion 3.2 will be added to the assessment of the major for AY 2017. **ACTION:** New course MATH 4223 Introduction to Point Set Topology will be required by mathematics majors in the general and teacher certification options starting fall 2017. **ACTION:** Starting fall 2017, students in the mathematics general option will no longer require a minor to graduate.

Academic Year	Summary of Annual Reviews of Dean and/or UAC (Reviews found in Teams folder; UAC *does not* review annually)	Updates in Response to Reviews
2019-2020		
2018-2019		
2017-2018		
2016-2017		
2015-2016		

APPENDIX

Copy/paste screenshots or narrative of blank instruments (rubrics, surveys, data report requests, prepared spread sheets, etc) here.

RUBRIC FOR SLO 1.4 AND 2.3

0-69 Needs Work	70-89 Good	90-100 Superior	NAME _____ Presentation Date _____ SCORE _____	Points
			Organization/Preparation (30) - presentation is refined (obviously practiced) - information logically introduced - use of notes	
			Content (30) - correct mathematics - college level material	
			Presentation (40) - speaks clearly - appropriate language - appropriate body language - visuals	
			TOTAL	

RUBRIC FOR SLO 2.1

East Central University
Department of Mathematics

Reasoning, Proof, Mathematical Communication

Evaluation

Candidate Number _____ Semester/Year _____

COMPONENT	SCORE
Prove or Disprove	/6
Proof Evaluation	/5
Proof Writing	
Method	/4
Mathematics	/4
English	/4
COMPOSITE SCORE	/23

East Central University
Department of Mathematics

Reasoning, Proof, Mathematical Communication

Evaluator Instructions

1. "Prove or Disprove" Task (Max. **6** pts)
   - **a.** Candidate has been given **three** statements to prove or disprove.
   - **b.** Assign points as follows:
     - 1 pt for correctly identifying a given valid claim as true.
     - 1 pt for providing a correct* proof of a valid claim.
       * *Judged to be at least a 3 on the Mathematics Correctness scoring rubric.*
     - 1 pt for correctly identifying a given invalid claim as false.
     - 1 pt for producing an appropriate counterexample to disprove the invalid claim.
   - **c.** Write total points in the table on the cover page.

2. Proof Evaluation Task (Max. **5** pts)
   - **a.** Candidate has been given **three** proofs to evaluate. One proof is correct; two proofs are deficient in some way.
   - **b.** Assign points as follows:
     - 1 pt for correctly identifying each proof as flawed or correct. (Max. 3 pts)
     - 1 pt for correctly identifying the error in each flawed proof. (Max. 2 pts)
   - **c.** Write total points in the table on the cover page.

3. Proof Writing Task (Max. **12** pts)
   - **a.** Candidate has been given **four** proofs to write. On *each* proof judge the following:
     - **Method**
       Place a plus sign (+) at the top of the page if the candidate used an appropriate method for proving the given theorem.
       Place a minus sign (–) at the top of the page if the candidate did not use an appropriate method for proving the given theorem.
     - **Mathematics Correctness**
       Assign a score from 0 to 4 based on the Mathematics Correctness scoring rubric.
       Write "M = (rating)" at the top of the page.
     - **English Correctness**
       Assign a score from 0 to 4 based on the English Correctness scoring rubric.
       Write "E = (rating)" at the top of the page.
   - **b.** Count the number of +'s on the four proofs. Write the total in the table on the cover page.
   - **c.** Determine the mean (nearest tenth) of the "M" scores on the four proofs. Write this number in the table on the cover page.
   - **d.** Determine the mean (nearest tenth) of the "E" scores on the four proofs. Write this number in the table on the cover page.

4. Add all ratings to determine the **COMPOSITE SCORE**.

5. Return the portfolios to the department chair when finished.

RUBRIC FOR SLO 3.1

East Central University

Department of Mathematics & Computer Science

Lesson Plan Portfolio

Evaluation by Faculty for Mathematics Teacher Certification

Teacher Candidate Name:	Date of Review:
(circle one) Math Education Faculty or Director-Math Teacher Certification **Name**:	

Directions: Please complete this form for each set of lesson plans developed and submitted by candidates at the culmination of the Math 4915 Methods of Teaching Secondary Mathematics course. Determine which rating best describes the candidate's portfolio for each NCTM Standard element (or sub-element) and find the total for each NCTM Standard as well as the overall performance.

Rating	Description
Unacceptable	The candidate has a limited (beginning) awareness of the concepts underlying the standard/element. Little or no evidence for standard/element.
Acceptable	The candidate demonstrates growing awareness of the concepts in the area underlying the standard/element. Candidate provides evidence for a portion of the standard/element (partial supportive evidence).
Target	The candidate demonstrates outstanding awareness (proficient) of the concepts underlying the standard/element. Evidence for all aspects of the standard/element.

Standard 2: Mathematical Practices
Effective teachers of secondary mathematics solve problems, represent mathematical ideas, reason, prove, use mathematical models, attend to precision, identify elements of structure, generalize, engage in mathematical communication, and make connections as essential mathematical practices. They understand that these practices intersect with mathematical content and that understanding relies on the ability to demonstrate these practices within and among mathematical domains and in their teaching.

NCTM Element	Unacceptable (1)	Acceptable (2)	Target (3)	Score

2e	There is **limited** evidence of the teacher candidate's ability to demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts. **Lesson plans make no attempt to show mathematical connections.**	There is evidence of the teacher candidate's ability to demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts. **Lesson plans demonstrate mathematical connections at least once.**	There is evidence of the teacher candidate's ability to demonstrate the interconnectedness of mathematical ideas and how they build on one another and recognize and apply mathematical connections among mathematical ideas and across various content areas and real-world contexts. **Lesson plans demonstrate mathematical connections at least twice.**	
			Overall NCTM Standard 2 Performance Level Total:	#U: #A: #T:

Standard 3: Content Pedagogy
Effective teachers of secondary mathematics apply knowledge of curriculum standards for mathematics and their relationship to student learning within and across mathematical domains. They incorporate research-based mathematical experiences and include multiple instructional strategies and mathematics-specific technological tools in their teaching to develop all students' mathematical understanding and proficiency. They provide students with opportunities to do mathematics – talking about it and connecting it to both theoretical and real-world contexts. They plan, select, implement, interpret, and use formative and summative assessments for monitoring student learning, measuring student mathematical understanding, and informing practice.

NCTM Element	Unacceptable (1)	Acceptable (2)	Target (3)	Score
3a	Lesson planning **does not clearly demonstrate** evidence of the teacher candidate's ability to apply knowledge of the OASM and the relationship of the standards to student learning within and across mathematical domain. **No evidence of integration with other content areas.**	Lesson planning **demonstrates** the teacher candidate's basic knowledge of the OASM and the relationship of the standards to student learning within and across mathematical domains. **Evidence of interdisciplinary content for at least one other content area.**	Lesson planning **thoroughly demonstrates** the teacher candidate's consistent ability to apply knowledge of the OASM and the relationship of the standards to student learning within and across mathematical domains. **Evidence of interdisciplinary content for at least two other content areas.**	
3b	Lesson planning **does not clearly demonstrate** the teacher candidate's ability to analyze and consider **research** in planning for and leading students in rich mathematical learning experiences. **Lesson Plan Portfolio does not include a research article reflection .**	Lesson planning **demonstrates** the teacher candidate's ability to analyze and consider **research (primary)** in planning for and leading students in mathematical learning experiences. **At least one primary source. Lesson Plan Portfolio includes a research article reflection but either an unclear or missing explanation of the implementation of the ideas into planning mathematical learning experiences.**	Lesson planning **thoroughly demonstrates** the teacher candidate's ability to analyze and consider **several research sources (primary)** in planning for and leading students in rich mathematical learning experiences. **Two or more primary sources. Lesson Plan Portfolio includes a research article reflection and a clear explanation of the implementation of the ideas into planning mathematical learning experiences.**	
3c.1	Lesson plans and units **do not include any variety or differentiated instruction** plans that would meet the needs of all learners (diverse populations).	Lesson plans and units **include at least one alternate** form of instructional strategy that can be used for differentiated instruction that would meet the needs of all learners (diverse populations).	Lesson plans and units **include at least three alternate** forms of instructional strategies used for differentiation that would meet the needs for all learners (diverse populations).	
3c.2	Lesson plans and units **do not include** the use of mathematics-specific instructional technologies.	Lesson plans and units **include at least one use** of **appropriate** mathematics-specific instructional technologies in an attempt to build **most** students' conceptual understanding and procedural proficiency.	Lesson plans and units **include the appropriate incorporation of two or more** mathematics-specific instructional technologies that build **all** students' conceptual understanding and procedural proficiency.	

3d	**At most one** of the lesson plans demonstrate the teacher candidate's ability to provide students with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.	**At least two** of the lesson plans demonstrate the teacher candidate's ability to provide students with an opportunity to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.	**Three or more** of the lesson plans demonstrate teacher candidate's providing students with opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace.	
3e.1	At most one of the lesson plans and units **include** techniques related to student engagement and communication including selecting high quality tasks that focus on key mathematical ideas. **At most 1 Lesson Plan includes one engaging technique/activity.**	At least two of the lesson plans and units collectively **include at least one technique** related to student engagement and communication including selecting high quality tasks that focus on key mathematical ideas. **2 Lesson Plans include at least one engaging technique/activity.**	Three or more of the lesson plans and units collectively **include a variety of techniques (one or more each)** related to student engagement and communication including selecting high quality tasks that focus on key mathematical ideas. **3 or more Lesson Plans include one or more engaging techniques/activities.**	
3e.2	**At most one** of the lesson plans and unit demonstrate the candidate's ability to implement techniques related to student engagement and communication including guiding mathematical discussion and employing a range of questioning strategies.	**At least two** of the lesson plans and units **demonstrate** the candidate's ability to implement techniques related to student engagement and communication including guiding mathematical discussion and employing a range of questioning strategies.	**Three or more** of the lesson plans and units **thoroughly** demonstrate the candidate's ability to implement a **variety** of techniques related to student engagement and communication including guiding mathematical discussion and employing a range of questioning strategies.	
3f	Lesson plans and units **do not include** assessments.	Lesson plans and units **include a variety (at most 2 types)** of assessments. Assessments may focus solely on recall of facts or algorithms.	Lesson plans and units **consistently include a variety (3 or more types)** of assessments and includes assessments focused on conceptual understanding as well as understanding students' thinking about mathematics on varying levels of difficulty.	
			Overall NCTM Standard 3 Performance Level Total:	#U: #A: #T:

Standard 4: Mathematical Learning Environment
Effective teachers of secondary mathematics exhibit knowledge of adolescent learning, development, and behavior. They use this knowledge to plan and create sequential learning opportunities grounded in mathematics education research where students are actively engaged in the mathematics they are learning and building from prior knowledge and skills. They demonstrate a positive disposition toward mathematical practices and learning, include culturally relevant perspectives in teaching, and demonstrate equitable and ethical treatment of and high expectations for all students. They use instructional tools such as manipulatives, digital tools, and virtual resources to enhance learning while recognizing the possible limitations of such tools.

NCTM Element	Unacceptable (1)	Acceptable (2)	Target (3)	Score
4a	**At most one** of the lesson plans **demonstrate knowledge** of adolescent learning, development, and behavior and/or **do not demonstrate a positive disposition** toward mathematical processes and learning.	**At least two** of the lesson plans **demonstrate** a basic knowledge of adolescent learning, development, and behavior.	**Three or more** of the lesson plans **exhibit deep knowledge** of adolescent learning, development, and behavior **and** demonstrate a positive disposition toward mathematical processes and learning.	
4b	The lesson plans **do not include** learning opportunities in which	The lesson plans **include** learning opportunities in which students are participating in **one of the following**: (check appropriate)	The lesson plans **include** learning opportunities in which students are BOTH actively engaged in building new knowledge **AND** new learning is	

	students are actively engaged in building new knowledge from prior knowledge and/or experiences.	☐ actively engaged in building new knowledge OR ☐ new learning is connected to prior knowledge and/or experiences. Lesson Plans are not always developmentally appropriate, sequential, or challenging.	connected to prior knowledge and/or experiences. Lesson Plans are developmentally appropriate, sequential, and challenging.	
4c	The lesson plans **do not demonstrate** candidate knowledge of individual differences and the cultural and language diversity that exists within classrooms.	The lesson plans **demonstrate** the candidate's ability for <u>one of the following</u>: (check appropriate) ☐ incorporate knowledge of individual differences and the cultural and language diversity that exists within classrooms <u>OR</u> ☐ efforts to motivate and engage students by means of culturally relevant perspectives	The lesson plans **incorporate** <u>BOTH</u> of the following: ▪ knowledge of individual differences and the cultural and language diversity that exists within classrooms ▪ culturally relevant perspectives as a means to motivate and engage students.	
4e.1	The lesson plans **do not demonstrate** a basic ability to apply mathematical content and/or pedagogical knowledge to select and use instructional tools. **Lesson plans do not include instructional tools.**	<u>At least one</u> lesson plan **demonstrates a basic ability** to apply mathematical content and pedagogical knowledge to select and use instructional tools listed below: (check all that apply) ☐ manipulatives and physical models ☐ drawings ☐ virtual environments, spreadsheets ☐ presentation tools ☐ mathematics-specific technologies (e.g., graphing tools, interactive geometry software, computer algebra systems, and statistical packages). **Other:**	<u>At least two</u> lesson plans **demonstrate an advanced ability** to apply mathematical content and pedagogical knowledge to select and use a **variety** (<u>at least two types</u>) of instructional tools such as: (check all that apply) ☐ manipulatives and physical models ☐ drawings ☐ virtual environments, spreadsheets ☐ presentation tools ☐ mathematics-specific technologies (e.g., graphing tools, interactive geometry software, computer algebra systems, and statistical packages). **Other:**	
4e.2	The lesson plans **do not demonstrate the ability** to make sound decisions about mathematical instruction tools to enhance teaching and learning. **No use of such tools and/or no explanation regarding limitations.**	The lesson plans **demonstrate a basic ability** to use apply mathematical content and/or pedagogical knowledge to either: (check appropriate) ☐ make sound decisions about when such tools enhance teaching and learning <u>OR</u> ☐ recognize both the insights to be gained and possible limitations of such tools. **Lesson plans clearly include the use of <u>at least one</u> appropriate math-specific technologies.**	The lesson plans **demonstrate an advanced ability** to: apply mathematical content and pedagogical knowledge to make sound decisions about when such tools enhance teaching and learning <u>AND</u> recognize both the insights to be gained and possible limitations of such tools. **Lesson plans include the use of a variety (<u>2 or more</u>) of appropriate math-specific technologies.**	
			Overall NCTM Standard 4 Performance Level Total:	#U: #A: #T:

Standard 6: Professional Knowledge and Skills
Effective teachers of secondary mathematics are lifelong learners and recognize that learning is often collaborative. They participate in professional development experiences specific to mathematics and mathematics education, draw upon mathematics education research to inform practice, continuously reflect on their practice, and utilize resources from professional mathematics organizations.

NCTM Element	Unacceptable (1)	Acceptable (2)	Target (3)	Score
6c	The lesson plans **do not use** resources from professional mathematics education organizations.	The lesson plans **show clear resource utilization** (at least one) from professional mathematics education organizations such as print, digital, and virtual resources/collections.	Lesson Plans and units **shows use of a variety of resources** (two or more) from professional mathematics education organizations such as print, digital, and virtual resources/collections.	
			Overall NCTM Standard 6 Performance Level Total:	#U: #A: #T:

Lesson Plan Portfolio
Overall NCTM Standard Performance Score (Add up totals from Standards 2 through 6)
Total Performance Score:

#Unacceptable: **#Acceptable:** **#Target:**

Comments:

Signature: _____