**UNK Science/Math Education M.S.Ed. Program Comprehensive Exam Policy & Procedures**

**Requirement for Graduation: UNK requires all Master's degree candidates to show proficiency in their field of study *via* mechanisms determined by each individual program. *In the Science/Math Education M.S.Ed. Program, candidates must pass a Comprehensive Exam prior to graduation.***

**Purpose:** The purpose of the Comprehensive Exam is to determine the degree candidate's level of knowledge and ability to apply that knowledge to their teaching assignment, as well as the impact of degree coursework on the candidate's professional knowledge.

**Exam Format:** The Exam will take place in two parts. Part 1 is a closed-book, closed-notes written test the will contain questions on topics relating to between one-half and three-fourths of the courses in the student's degree program. Questions are composed by course instructors and compiled by the Program Director. Students may come to UNK to take the test or arrange for a proctor (usually a supervisor, work colleague, or other responsible adult who is not related or married to the student) in order to take the test in their community. ***If the student does sufficiently well on the Part 1 test (see the "Part 1 Grading" section), he or she will <u>not</u> need to take Part 2.***

The format of Part 2 will be determined by the Program Committee but will usually consist of a meeting between the student and the Committee in person or *via* videoconferencing means (Skype, Zoom, etc.) during which the student will answer questions posed by Committee members. *Part 2 will be focused on topic areas that were determined through the Part 1 grading to not meet program assessment expectations.*

**Part 1 Grading:** Each test question will be linked to one or more of the program assessment target categories shown in the attached grading rubric/scale. How well a question response reflects the student's proficiency in the linked assessment target category(ies) will be scored on a 10-point scale. For categories linked with multiple questions, the scores will be averaged. To pass in a particular category, the student must score (or average) at least 7 out of 10 points ("Meets Expectations"). ***If the student passes in <u>all</u> categories assessed, then he or she passes the Comprehensive Exam without needing to take Part 2.*** If one or more of the assessed categories have (average) scores lower than 7 ("Does Not Meet Expectations"), then the student must take Part 2.

**Part 2 Grading:** There is no numerical grading for Part 2. The Program Committee will evaluate the student's answers and determine if they demonstrate sufficient proficiency to "Meet Expectations" according to the grading rubric/scale for the assessment target categories that had scores below 7 on the Part 1 test. If so, the student will pass the Comprehensive Exam. If not, the student will fail the Exam.

**Repeating the Comprehensive Exam:** Each student will be given a maximum of two attempts to pass the Comprehensive Exam. Upon failing the first attempt, the student must repeat the entire process the following (or later) semester or summer. Upon failing the second attempt, the student will be dismissed from the Program.

**Appendix Materials:**

A. Science/Math Education Comprehensive Exam Application Form
B. Comments on what is covered in the Comprehensive Exam
C. Comprehensive Exam Grading Rubric/Scales
D. Example Part 1 Grading Sheet

**Appendix A: Science/Math Education Comprehensive Exam Application**

**To be completed by the student:**

Student Name: _____ NUID: _____

Street address: _____

City: _____ State: _____ Zip: _____

E-mail: _____ Phone: _____

Area of Emphasis: _____

Will you take the Part 1 test at UNK? YES ___ NO___

(If NO, complete the proctor section below.)

**Student Signature:** _____ **Date:** _____

**To be completed by the exam proctor:**

Proctor Name: _____ Title/Position: _____

Street address: _____

City: _____ State: _____ Zip: _____

E-mail: _____Work Phone: _____

Relationship to student: _____

Date exam will be administered: _____

*I hereby agree to serve as an exam proctor for the above named student. I will provide a quiet atmosphere for the student to take the exam, will monitor the student during the assessment period, and will submit the completed test along with verification and identification materials, as specified in the examination materials.*

**Proctor Signature:** _____ **Date:** _____

**Return the completed and signed form by fax, scan/e-mail, or mail to:**

**Holly Peterson, Coordinator**
**Science/Math Education M.S.Ed. Program**
**University of Nebraska at Kearney**
**2401 11th Avenue**
**405D Bruner Hall**
**Kearney, NE 68849-1150**

**Phone: (308) 865-8043**
**Fax: (308) 865-8399**
**e-mail: msedsci@unk.edu**

**Appendix B: Comments on what is covered in the Comprehensive Exam**

Part 1 will be a 3-4 hour test that usually has 6-8 questions of typically open-ended or comprehensive natures, although there may be some specific problem solving asked of you in certain questions. You'll see both education- and science/math-based questions. Things of an open-ended nature to think about:

- How would you design a lesson plan/lab experience/research project?
- For a given lesson unit, how/why would you choose certain pedagogical methods to apply? How would you accommodate different learning styles?
- In a given class or lesson unit, what content/curriculum standards come into play and how do you apply them?
- How does math influence science topic X? How do you overcome student difficulties with math?
- How would you teach topic _____ to students?

Going over any term papers or projects you had in your courses would be a good idea -- **in general, the more correct terminology and principles you can apply to these open-ended questions, the better.** You will also likely see some specific math and/or science content questions, depending on your emphasis area and course experience. I suggest reviewing the exams from your math and science classes. Expect about one-half to three-fourths of your degree program classes to be touched on by one or both parts of the exam.

**Appendix C: Comprehensive Exam Grading Rubric/Scales**

*<u>All</u> assessment target categories on this page will be linked to at least one Part 1 test question.*

| Target | Exceeds Expectations (9 or 10 points) | Meets Expectations (7 or 8 points) | Does Not Meet Expectations (below 7 points) |
|---|---|---|---|
| 1.1 Candidate successfully articulates the major concepts, principles, theories, and laws of their field of specialization. | Candidate demonstrates in-depth knowledge of the subject through inquiry, critical analysis, and synthesis. | Candidate can explain important principles and concepts delineated in professional standards. | Candidate is unable to give examples of important principles and concepts delineated in professional standards. |
| 2.1 Candidate successfully conveys interrelationships between concepts and processes in their field of specialization and those of other science/math fields. | Candidate can articulate the knowledge and practices of science, including the unifying concepts of science as described by NSTA. | Candidate can explain content in supporting fields and how that content relates to the field of specialization; identifies mathematics skills that are applicable to science topics. | Candidate fails to identify and explain connections between the field of specialization and supporting science/math fields. |
| 2.2 Candidate applies appropriate mathematics and statistics concepts to science topics. | Candidate is able to apply mathematics and statistics concepts in the context of more than one science discipline. | Candidate can explain and use mathematics and statistics in the context of a science discipline. | Candidate is unable to use mathematics and statistics concepts in the context of a science discipline. |
| 3.1 Candidate summarizes current theories related to pedagogy and learning. | Candidate is able to critique research and theories related to pedagogy and learning. | Candidate demonstrates in-depth knowledge of instructional strategies and theories related to pedagogy and learning in their field. | Candidate demonstrates limited understanding of the relationship between content and content-specific pedagogy, is unable to explain linkages between theory and practice. |
| 3.2 Candidate applies a variety of research-based instructional strategies to promote student learning. | Candidate demonstrates expertise in pedagogical content knowledge and preconceptions that hinder learning; is able to select and develop instructional strategies and technologies, based on research and experience that help all students learn. | Candidate is able to select and use a broad range of instructional strategies and technologies that promote student learning and is able to clearly explain the choices used in their practice. | Candidate is unable to select or use a broad range of instructional strategies that build on students' backgrounds and knowledge of content. |

**Appendix D: Example Part 1 Test Grading Sheet**

**Instructions for Program Committee members and other faculty members asked to evaluate any answers:** For each question that you feel you have sufficient expertise to evaluate, please score the student's answer on a 10-point scale as they apply to each listed program assessment learning objective. The assessment rubric with point scale is attached.

Student: _____ Evaluator: _____

| Question | Learning Objective | Score | Comments (required if score is below 7) Use the back or an additional sheet if needed |
|---|---|---|---|
| 1 | 1.1 | | |
| 2 | 1.1 | | |
| 3 | 2.1 | | |
| 4 | 4.2 | | |
| 5 | 3.1 | | |
| 6 | 3.1 | | |
| 7 | 3.2 | | |