

# **Initial Endorsement Content Preparation Review**

## **General Science Grades 7-12**

**Note: The following content area preparation review is for application to the UAA Master of Arts in Teaching program leading to an initial Alaska Type A Certificate with an endorsement in General Science Grades 7-12. These requirements are based on the *Standards for Science Teacher Preparation* published by the National Science Teachers Association, and the Alaska Content, Cultural, and Performance Standards, which define what students in grades 7-12 should know about science and be able to do with that knowledge. Once the applicant has been admitted to the Master of Arts in Teaching with an endorsement in General Science, evaluation of progress toward certification will be guided by the NSTA Standards for Science Teacher Preparation, the Alaska Content, Cultural, and Performance Standards for Students, and the Standards for Alaska Teachers.**

Applicants must have a baccalaureate degree in a science discipline or closely related field with a minimum of 12 semester credits in each the four primary fields: Biology, Chemistry, Earth/Space Sciences, and Physics.

The following matrix is intended to guide the applicant in demonstrating content knowledge through transcripts, PRAXIS II scores, reflective essays, and/or relevant work experiences. The applicant should list courses in the appropriate matrix cell and attach transcripts for documentation, test score reports, and narratives for work/life experience documentation. For coursework, applicants may be required to submit course syllabi, course products, or other documentation regarding the content of the course. When the documentation is work/life experience, the applicant must provide an annotated resume (supported by items such as letters of reference or employee evaluations) and a brief reference to this material in the appropriate cell. All of the evidence will be evaluated by a College of Education Science Education Faculty Advisor. Applicants will be notified if further evidence and/or coursework is needed.

## Initial Endorsement Content Preparation Review General Science Grades 7-12

Applicant \_\_\_\_\_

Social Security/Student ID# \_\_\_\_\_

COE Science Advisor Signature \_\_\_\_\_

Date \_\_\_\_\_

PRAXIS II: General Science \_\_\_\_\_

GPA \_\_\_\_\_

Total Credits \_\_\_\_\_

Baccalaureate Science Major \_\_\_\_\_

GPA in major \_\_\_\_\_

### SCIENCE PREPARATION

<i>NSTA Standard</i>	<i>Applicant's Coursework</i> Note: A course may be used as evidence for more than one standard. However, the credits may only be counted in the total for one standard.	<i>Praxis Subsection Score/Other Evidence</i>	<i>Meets Standard/Evidence Needed</i>  (Advisor's Initials)	<i>Actions Required by Applicant</i>
<b>Standard 1. CONTENT</b>	Course      Credits      Date      Grade		MS    EN Advisor_____	
<p><i>Understands the major concepts, principles, theories, laws and interrelationships of general science.</i> <small>(Applicants must have a major or equivalent in one of the four science disciplines or closely related field. In addition, a minimum of 12 semester credits in each of the other disciplines is required.)</small></p>				
<p><i>Biology</i></p> <ol style="list-style-type: none"> <li>1. Life processes in living systems including organization of matter and energy.</li> <li>2. Similarities and differences among animals, plants, fungi, microorganisms, and viruses.</li> <li>3. Principles and practices of biological classification.</li> <li>4. Scientific theory and principles of biological evolution.</li> <li>5. Ecological systems including the interrelationships and dependencies of organisms with each other and their environments.</li> <li>6. Population dynamics and the impact of population on its environment.</li> </ol>			Advisor verified_____	

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7. General concepts of genetics and heredity. 8. Organization and functions of cells and multicellular systems. 9. Behavior of organisms and their relationships to social systems. 10. Regulation of biological systems including homeostatic mechanisms. 11. Fundamental processes of modeling and investigating in the biological sciences. 12. Applications of biology in environmental quality and in personal and community health.				
<i>Chemistry</i> 1. Fundamental structures of atoms and molecules. 2. Basic principles of ionic, covalent, and metallic bonding. 3. Physical and chemical properties and classification of elements including periodicity. 4. Chemical kinetics and thermodynamics. 5. Principles of electrochemistry. 6. Mole concept, stoichiometry, and laws of composition. 7. Transition elements and coordination compounds. 8. Acids and bases, oxidation-reduction chemistry, and solutions. 9. Fundamental biochemistry. 10. Functional and polyfunctional group chemistry. 11. Environmental and atmospheric chemistry. 12. Fundamental processes of			Advisor verified____	

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investigating in chemistry. 13. Applications of chemistry in personal and community health and environmental quality.				
<i>Earth/Space</i> 1. Characteristics of land, atmosphere, and ocean systems on Earth. 2. Properties, measurement, and classification of Earth materials. 3. Changes in the Earth including land formation and erosion. 4. Geochemical cycles including biotic and abiotic systems. 5. Energy flow and transformation in Earth systems. 6. Hydrological features of the Earth. 7. Patterns and changes in the atmosphere, weather, and climate. 8. Origin, evolution, and planetary behaviors of Earth. 9. Origin, evolution, and properties of the universe. 10. Fundamental processes of investigating in the Earth and space sciences. 11. Sources and limits of natural resources. 12. Applications of Earth and space sciences to environmental quality and to personal and community health and welfare.			Advisor verified____	

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<i>Physics</i> 1. Energy, work, and power. 2. Motion, major forces, and momentum. 3. Newtonian principles and laws including engineering applications. 4. Conservation of mass, momentum, energy, and charge. 5. Physical properties of matter. 6. Kinetic-molecular motion and atomic models. 7. Radioactivity, nuclear reactors, fission, and fusion. 8. Wave theory, sound, light, the electromagnetic spectrum and optics. 9. Electricity and magnetism 10. Fundamental processes of investigating in physics. 11. Applications of physics in environmental quality and to personal and community health.			Advisor verified_____	

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<i>Understands the unifying concepts of science</i> 1. Multiple ways we organize our perceptions of the world and how systems organize the studies and knowledge of science. 2. Nature of scientific evidence and the use of models for explanation. 3. Measurement as a way of knowing and organizing observations of constancy and change. 4. Evolution of natural systems and factors that result in evolution or equilibrium. 5. Interrelationships of form, function, and behaviors in living and nonliving systems.			Advisor verified____	
<i>Understands important personal and technological applications of science</i>			Advisor verified____	
<i>Understands research and can design, conduct, report and evaluate investigations in science</i>			Advisor verified____	
<i>Understands and can use mathematics to process and report data and solve problems</i>			Advisor verified____	
<b>Standard 2. NATURE OF SCIENCE</b>			<b>MS    EN</b> <b>Advisor_____</b>	

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<i>Understands the historical and cultural development of science and the evolution of knowledge in science</i>			Advisor verified____	
<i>Understands the philosophical tenets, assumptions, goals, and values that distinguish science from technology and others ways of knowing the world</i>			Advisor verified____	
<b>Standard 3. INQUIRY</b>			<b>MS    EN</b> <b>Advisor_____</b>	
<i>Understands the processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge</i>			Advisor verified____	
<b>Standard 4. CONTEXT</b>			<b>MS    EN</b> <b>Advisor_____</b>	
<i>Understands important social issues related to science and technology and processes used to analyze and make decisions on such issues</i>			Advisor verified____	