



**UNIVERSITY OF MARYLAND GLOBAL CAMPUS (UMGC)**  
**DEPARTMENT OF EDUCATION**

**Conceptual Framework (CF) Alignment:** UMGC’s professional education unit instills in all candidates the belief that all students can learn and learn at high levels, and that they as teachers and teacher candidates are instrumental in ensuring that this learning occurs. This transcript review form is used for MAT admissions in conjunction with Key Assessments 2 – Description of transcript analysis process, which aligns with CF Learning Objective 1: Teaching for Learning – The candidate acts upon academic content, professional and pedagogical knowledge, and understanding of students to maximize student achievement. The use of this transcript review form also aligns with the Department’s Professional Dispositions category 1: Relationship with students through curriculum and instruction.

**MAT TRANSCRIPT REVIEW FORM FOR SECONDARY PHYSICS,  
7-12 GRADE TEACHER CERTIFICATION NSTA/NGSS STANDARDS 2013**

<b>NSTA/NGSS Assessment Standards for Certification</b>	<b>Typical Courses Aligned with Standards (Course Samples)</b>	<b>Courses Completed (Include Prefix, Number, and Name)</b>	<b># of Credits</b>
Forces and Motion  Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects  Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object	Mechanics  General Physics  Principles of Physics		

<p>Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration</p> <p>Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the object</p> <p>Apply science and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision</p>			
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Types of Interactions

Ask questions about data to determine the factors that affect the strength of electric and magnetic forces

Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects

Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact

Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the

Electricity and Magnetism

Electromagnetic Phenomena

gravitational and electrostatic forces  
between objects

Plan and conduct an investigation to provide  
evidence that an electric current can produce  
a magnetic field and that a changing  
magnetic field can produce an electric  
current

Communicate scientific and technical

<p>Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction</p>			
<p>Wave Properties</p> <p>Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave</p> <p>Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various objects</p> <p>Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media;</p> <p>Evaluate questions about the advantages of using digital transmission and storage of information</p> <p>Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other</p> <p>Communicate technical information about how some technological devices use the principles of wave behavior and wave</p>	<p>General Physics</p> <p>Electricity and Magnetism</p> <p>Introduction to Quantum Mechanics</p> <p>Vibrations, Waves, and Optics</p>		



**Note:** Applicants may qualify to enter the MAT program with a content specialization in Physics if they have an undergraduate major in the certification area, or if they have completed 30 credit hours of coursework in Physics.

**Secondary Physics, 7-12 Grade Teacher Certification**

Full standards are available at NSTA: <https://ngss.nsta.org/>