

**University of Maryland University College (UMUC)**  
**Department of Education**

**Conceptual Framework (CF) Alignment:** UMUC’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 Standards 2003**

NSTA Assessment Standards for Certification	Typical Courses Aligned with Standards (Course Samples)	Courses Completed (Include Prefix, number, and Name)	# of Credits
Demonstrate concepts of energy, work and power	<ul style="list-style-type: none"> <li>• General Physics</li> <li>• How Things Work</li> </ul>		
Demonstrate concepts of Newtonian physics with engineering applications	<ul style="list-style-type: none"> <li>• Analytical Mechanics</li> <li>• Principles of Physics</li> </ul>		
Demonstrate concepts of conservation mass, momentum, energy and charge	<ul style="list-style-type: none"> <li>• Properties of Matter</li> <li>• Quantum Physics</li> </ul>		
Demonstrate concept of kinetic-molecular motion and atomic models	<ul style="list-style-type: none"> <li>• Atomic Physic &amp; Quantum Theory</li> <li>• Vibrations, Waves, Heat &amp; Thermodynamics</li> </ul>		
Demonstrate concept of radioactivity,	<ul style="list-style-type: none"> <li>• Atomic and Nuclear Physics</li> </ul>		

nuclear reactors, fission and fusion	<ul style="list-style-type: none"> <li>• Electronics</li> </ul>		
Demonstrate concept of wave theory, sound, light, electromagnetic spectrum, optics	<ul style="list-style-type: none"> <li>• Physics of Music Laboratory</li> <li>• Intro to Holograph</li> <li>• Wave Optics</li> </ul>		
Demonstrate concepts of Electricity and magnetism	<ul style="list-style-type: none"> <li>• Electricity &amp; Magnetism</li> <li>• Electronic Magnetic Phenomena</li> </ul>		
Demonstrate concept of Fundamental processes of investigating in physics	<ul style="list-style-type: none"> <li>• Experimental Physics</li> <li>• Intermediate Physics Laboratory</li> </ul>		
Applications of physics in environmental quality and to personal and community health	<ul style="list-style-type: none"> <li>• Chemistry in the Modern World</li> <li>• Environmental Chemistry</li> </ul>		
Demonstrate concept of thermodynamics and energy-matter relationships	<ul style="list-style-type: none"> <li>• Thermodynamics &amp; Kinetic Theory</li> </ul>		
Demonstrate concept of nuclear physics, angular rotation, momentum centripetal forces and vector analysis	<ul style="list-style-type: none"> <li>• Mathematical &amp; Computational Methods</li> <li>• Calculus</li> </ul>		
Demonstrate concept of quantum mechanics, space-time relationships, special relativity	<ul style="list-style-type: none"> <li>• Quantum Physics</li> <li>• Physics &amp; Relativity</li> </ul>		
Models of nuclear and subatomic structures and behavior	<ul style="list-style-type: none"> <li>• Subatomic Physics</li> <li>• Nuclear &amp; Particle Physics</li> </ul>		

Demonstrate concept of Light behavior, including wave-particle duality and models	<ul style="list-style-type: none"> <li>• Physics Laboratory</li> <li>• Analog Electronics</li> </ul>		
Demonstrate concepts of electrical phenomena	<ul style="list-style-type: none"> <li>• Electrical Circuits &amp; Electronics</li> <li>• Semiconductor Physics</li> </ul>		
Historical development and cosmological perspectives in physics	<ul style="list-style-type: none"> <li>• The Astronomical Universe</li> <li>• Space, Time, and Matter</li> </ul>		
How to design, conduct and report research in physics	<ul style="list-style-type: none"> <li>• Research in Physics</li> <li>• Research Problems in Physics</li> </ul>		
Application of physics and engineering in society, business, industry and health fields	<ul style="list-style-type: none"> <li>• Professional Physics Seminar</li> <li>• Science &amp; Society: Global Challenges</li> </ul>		
Apply concepts from other sciences: biology, chemistry, earth/space sciences, and mathematics	<ul style="list-style-type: none"> <li>• Biochemistry</li> <li>• Astronomy</li> </ul>		
		<b>Total Credits:</b>	

**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: <http://www.nsta.org/preservice/docs/NSTASTandards2003.pdf>