University of Maryland University College (UMUC)

Secondary Chemistry, 7-12 Grade Teacher Certification

MAT Transcript Review in Chemistry - NSTA Standards 2003

NSTA Assessment Standards for Certification	Typical Courses Aligned with Standards (Course Samples)	Courses Completed (Include Prefix, number, and Name)	# of Credits
Concepts in fundamental structures of atoms and molecules	• Atoms & Molecules • General Chemistry		
Concepts in basic principles of ionic, covalent and metallic bonding	• Inorganic Chemistry • Atoms		
Concepts in physical and chemical properties and classifications; periodicity	• Physical Chemistry • Theoretical foundations of Physical Chemistry		
Concepts in chemical kinetics, thermodynamics, electrochemistry	• Physical Chemical Thermodynamics • Electrochemistry		
Environmental and atmospheric chemistry	• Ecological Biochemistry • General Ecology		
Fundamental processes of investigating in chemistry	• Forensic Chemistry • Intro to Analytical Chemistry		
Applications of chemistry in personal and community health and environment.	• Environmental Chemistry • Chemistry of Dangerous Drugs		
Molecular orbital theory, aromaticity metallic and ionic structures, correlation to properties of matter	• Inorganic Chemistry • Organic Chemistry		

Superconductors and principles of metallurgy; advanced concepts of chemical kinetics and thermodynamics	• Principles of Physical Chemistry • Thermodynamics		
Major biological compounds and natural products	• Biochemistry • Molecular Biology		
Chemical reactivity and molecular structure; organic synthesis and organic reaction mechanisms	• Structural Determination using Spectroscopic Methods • Radiochemistry		
Energy flow through chemical systems; issues related to chemistry; ground water pollution, disposal of plastics, alternative fuels.	• Air Pollution • Chemical & Bacteriological Studies on Water Pollution		
Historical development and perspectives in chemistry	• Chemical Literature • Professional Issue in Chemistry & Biochemistry		
How to design, conduct and report research in chemistry	• Chemical Research • Instrumental Analysis		
Applications of chemistry and chemical technology in society, business, industry and health fields	• Ethics in Science & Engineering • Chemical toxicology		
Concepts from biology, earth & space science, physics, and mathematics (relating to ecology, energetics of earth systems, magnetism, and equations)	• Geochemistry • Physics/ Calculus		
		TOTAL CREDITS:	

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

Secondary Chemistry, 7-12 Grade Teacher Certification
Full standards are available at NSTA: http://www.nsta.org/preservice/docs/NSTAstandards2003.pdf