GACE® Science Assessment Test II (025)
Curriculum Crosswalk

	Required Coursework Numbers														
Subarea I. Life Science (60%)															
Objective 1: Understands the structure of cells and basic cellular processes, including genetics															
A. Understands the basic structure and function of cells and their organelles															
• Structure and function of cell membranes															
• Structure and function of animal and plant cell organelles															
• Levels of organization and scale (molecules, cells, tissues, organs, organ systems)															
• Major features of common animal cell types															
• Prokaryotes and eukaryotes															
B. Understands key aspects of cell reproduction and division															
• Cell cycle															
• Mitosis															
• Meiosis															
• Cytokinesis															
C. Understands the basic biochemistry of life															
• Cellular respiration (aerobic and anaerobic)															
• Photosynthesis															
• Structure and function of biological molecules, such as DNA, carbohydrates, proteins, lipids, and enzymes															

	Required Coursework Numbers														
D. Understands basic genetics															
• Structure and function of DNA and RNA															
• Chromosomes, genes, and alleles															
• Dominant and recessive traits															
• Mendelian inheritance, including genotype, phenotype, use of Punnett squares, and pedigrees															
• Mutations, chromosomal abnormalities, and common genetic disorders															
Objective 2: Understands mechanisms of evolution, characteristics of organisms, and principles of ecology															
A. Understands the theory and key mechanisms of evolution															
• Mechanisms of evolution															
• Isolation mechanisms and speciation															
• Supporting evidence, including the fossil record, comparative genetics, and homologous structures															
B. Understands the elements of the hierarchical classification scheme															
• Classification schemes															
• Characteristics of bacteria, animals, plants, fungi, and protists															
• Characteristics of viruses															
C. Understands the major structures of plants and their functions															
• Characteristics of vascular and nonvascular plants															

	Required Coursework Numbers														
• Structure and function of roots, leaves, and stems															
• Asexual and sexual reproduction															
• Uptake and transport of nutrients and water															
• Tropisms: responses to stimuli															
D. Understands the basic anatomy and physiology of animals, including the human body															
• Response to stimuli and homeostasis															
• Systems that exchange with the environment, including respiratory, excretory, and digestive systems															
• Internal transport and exchange, including the circulatory system															
• Control systems, such as the nervous system and the endocrine system															
• Movement and support systems, including the skeletal and muscular systems															
• Reproduction and development															
• Immune system															
E. Understands population dynamics															
• Growth curves and carrying capacity															
• Behavior, such as territoriality															
• Intraspecific relationships, such as mating systems, social systems, and competition															
F. Understands community ecology															
• Niche															
• Species diversity															

	Required Coursework Numbers														
• Interspecific relationships, such as predator-prey and parasitism															
G. Understands ecosystems															
• Biomes															
• Stability and disturbances, such as glaciation, climate change, and succession															
• Energy flow, such as trophic levels and food webs															
Subarea II. Earth and Space Science (40%)															
Objective 1: Understands geology, including Earth's structure, rocks, minerals, plate tectonics, and historical geology															
A. Understands the types and basic characteristics of rocks and minerals and their formation processes															
• The rock cycle															
• Characteristics of sedimentary, igneous, and metamorphic rocks and their formation processes															
• Characteristics of minerals and their formation processes															
B. Understands the processes involved in erosion, weathering, and sedimentation of Earth's surface materials															
• Erosion and sedimentation															
• Chemical and physical weathering															
• Characteristics of soil															
• Porosity and permeability															

	Required Coursework Numbers														
C. Understands Earth's basic structure and internal processes															
• Earth's layers, such as the crust, mantle, and core															
• Shape and size of Earth															
• Geographical features															
• Earth's magnetic field															
D. Understands plate tectonic theory															
• Folding and faulting															
• Processes at plate boundaries, such as seafloor spreading															
• Basic characteristics of various types of volcanoes															
• Basic characteristics of earthquakes, including seismic waves and triangulation															
E. Understands historical geology															
• Principle of uniformitarianism															
• Basic principles of relative age dating, including superposition, stratigraphic correlation, and fossil succession															
• Absolute (radiometric) dating															
• Geologic time scale (era and periods)															
• Fossil record as evidence of the origin and development of life, including fossilization methods, mass extinctions, ice ages, and meteor impacts															

	Required Coursework Numbers														
Objective 2: Understands the hydrosphere and atmosphere, including water cycle, bodies of water, weather, and climate															
A. Understands the water cycle															
• Evaporation and condensation															
• Precipitation															
• Runoff and infiltration															
• Transpiration															
• Properties of water that affect Earth systems such as density, changes on freezing, high heat capacity, and solvent properties															
B. Understands the characteristics and processes of Earth's oceans and other bodies of water															
• Distribution and location of Earth's water															
• Seawater composition															
• Coastline topography and topography of ocean floor															
• Tides, waves, and currents															
• Estuaries, barrier islands, islands, reefs, and atolls															
• Polar ice, icebergs, and glaciers															
• Lakes, ponds, and wetlands															
• Streams, rivers, and river deltas															
• Groundwater, water table, wells, aquifers, geysers, and springs															

	Required Coursework Numbers														
C. Understands the basic structure and composition of Earth's atmosphere															
• Layers															
• Composition of atmosphere															
• Atmospheric pressure and temperature															
D. Understands basic concepts of weather development															
• Relative humidity															
• Dew point															
• Wind															
• Cloud types and formation															
• Types of precipitation															
• Air masses, fronts, storms, and severe weather, such as hurricanes and tornadoes															
• Development and movement of weather patterns															
E. Understands the major factors that affect climate and seasons															
• Effects of latitude, geographical location, and elevation															
• Effects of atmospheric circulation, such as trade winds and jet streams															
• Effects of ocean circulation															
• Characteristics and locations of climate zones, such as the Tropics and the Arctic															
• Effect of the tilt of Earth's axis on seasons															

	Required Coursework Numbers														
• Effects of natural phenomena, such as volcanic eruptions and solar radiation variations															
• El Niño, La Niña, and monsoons															
Objective 3: Understands astronomy, including solar system, stars, and other features of the universe															
A. Understands the major features of the solar system															
• Structure of the solar system															
• Effects of motion and gravity															
• Characteristics of the Sun, Moon, and planets															
• Characteristics of asteroids, meteoroids, comets, and dwarf/minor planets															
• Theories of the origin of the solar system															
B. Understands the interactions of the Earth-Moon-Sun system															
• Effect on seasons															
• Effect on tides															
• Earth's rotation and orbital revolution around the Sun															
• Phases of the Moon															
• Solar and lunar eclipses															
• Time zones															
• Effect of solar wind on Earth															

	Required Coursework Numbers														
C. Understands major features of the universe															
• Galaxies															
• Characteristics of stars and their life cycles															
• Dark matter															
• Theories of the origin of the universe															
• Technology and measurement techniques used to investigate the universe, such as telescopes, spectroscopes, and probes															