Bioscience/Biotechnology 1 (BIT300) Semester 1 Final Assessment Blueprint

Year Created: 2024-2025
Subject: Career & Technical Education
Method of Delivery: Online
Administration Window: December Common Finals

Item Types Included

Type	Number of Items	Description
MC	50	Multiple Choice - Select one answer

Resources

Bioscience Course Sequence

Standards At-A Glance

Standard	Number of Items	Standard Description
CTE [2021].VHEL.9-12.B.1.1	4	Identify and wear appropriate lab attire and personal protective equipment (e.g., safety glasses or goggles, lab coat, gloves, and closed-toe shoes)
CTE [2021].VHEL.9-12.B.1.10	1	Identify standard operating procedures (SOPs) for biological, biohazardous, and chemical spills, including broken glass
CTE [2021].VHEL.9-12.B.1.2	1	Identify emergency contacts and practice emergency protocols (e.g., fire procedure, shower safety, eyewash practice, and evacuation procedure)
CTE [2021].VHEL.9-12.B.1.3	3	Identify and follow handling instructions/information and usage of chemicals as identified in the safety data sheets (SDSs)
CTE [2021].VHEL.9-12.B.1.6	2	Identify biological, biohazardous, and chemical materials and explain appropriate handling (i.e., body fluids, ethidium bromide, sodium hypochlorite, etc.)
CTE [2021].VHEL.9-12.B.1.7	1	Identify and comply with safety signage and the significance of SDS symbols
CTE [2021].VHEL.9-12.B.1.8	1	Distinguish the characteristics of biosafety levels (e.g., BSL-1 to BSL-4)
CTE [2021].VHEL.9-12.B.1.9	1	Identify standard operating procedures (SOPs) for monitoring, using, storing, and disposal of biological, biohazardous, and chemical materials
CTE [2021].VHEL.9-12.B.10.1	11	Calculate and prepare solutions and buffers (e.g., mass/volume, %, molarity, and pH)
CTE [2021].VHEL.9-12.B.10.2	1	Calculate and prepare dilutions, including serial dilutions
CTE [2021].VHEL.9-12.B.10.3	1	Calculate the molar mass of a given compound using a Periodic Table of Elements
CTE [2021].VHEL.9-12.B.10.4	1	Label and store solutions and buffers (e.g., ingredients, preparer's initials, dates, concentration, lots, storage conditions, sterility, hazards, and special directions)
CTE [2021].VHEL.9-12.B.10.5	1	Use scientific sources to find appropriate solution preparation protocols
CTE [2021].VHEL.9-12.B.13.1	3	Perform calculations and solve problems using scientific notation
CTE [2021].VHEL.9-12.B.13.2	1	Utilize appropriate SI (International System of Units) base units and prefixes for all measurements (e.g., milli, micro, and nano)
CTE [2021].VHEL.9-12.B.13.3	2	Construct, interpret, and apply graphs using software tools (e.g., spreadsheets)
CTE [2021].VHEL.9-12.B.13.4	1	Calculate appropriate statistics (e.g., mean, median, mode, range, standard deviation, and linear regression)
CTE [2021].VHEL.9-12.B.2.1	1	Discuss the importance of state, local, and industry regulations (i.e., EPA, FDA, OSHA, NIH, AZDEQ, etc.)
CTE [2021].VHEL.9-12.B.2.2	1	Set up, maintain, and practice lab documentation (research approaches and observations) according to standard operating procedures (SOPs) (e.g., paper and/or electronic notebook)
CTE [2021].VHEL.9-12.B.2.5	1	Practice recording all research approaches and observations
CTE [2021].VHEL.9-12.B.3.1	1	Perform and document quality tests on reagents prepared or used in the lab to ensure reproducibility (i.e., pH, conductivity, spectrophotometry, etc.)
CTE [2021].VHEL.9-12.B.3.2	1	Describe manufacturing practices pertaining to quality control (e.g., standards and control chart ramifications)
CTE [2021].VHEL.9-12.B.3.3	1	Demonstrate reproducibility from an SOP and characterize variation across samples (i.e., trend analysis)
CTE [2021].VHEL.9-12.B.4.3	1	Design a research question with attention to relevant prior knowledge and develop a testable hypothesis
CTE [2021].VHEL.9-12.B.4.4	1	Design an experiment or a series of experiments based on prior research that is/are suitable to the hypothesis
CTE [2021].VHEL.9-12.B.4.5	1	Test the hypothesis using appropriate experimental design (analytical and statistical), distinguishing between control and experimental variables
CTE [2021].VHEL.9-12.B.4.6	1	Collect, record, and analyze data and analysis procedures
CTE [2021].VHEL.9-12.B.4.7	1	Develop conclusions based on evidence
CTE [2021].VHEL.9-12.B.4.8	2	Communicate results of scientific investigations in oral, written, digital, and graphical form using relevant technology and terminology
CTE [2021].VHEL.9-12.B.5.4	1	Apply risk management practices and policies to incident reporting
CTE [2021].VHEL.9-12.B.7.1	1	Use software for scientific analyses and documentation (e.g., spreadsheet, presentation, and word processing)
CTE [2021].VHEL.9-12.B.7.10	1	Identify and demonstrate proper use of hot plate/stirrers
CTE [2021].VHEL.9-12.B.7.11	1	Identify and demonstrate proper use of incubators, including shaking incubators
CTE [2021].VHEL.9-12.B.7.12	1	Identify and demonstrate proper use of water baths and heat blocks
CTE [2021].VHEL.9-12.B.7.13	5	Use a pH meter and explain the logarithmic nature of the pH scale
CTE [2021].VHEL.9-12.B.7.2	2	Identify and demonstrate proper use of laboratory glassware
CTE [2021].VHEL.9-12.B.7.3	1	Identify and demonstrate proper use of laboratory balances
CTE [2021].VHEL.9-12.B.7.4	1	Identify and demonstrate proper use of micropipettes
CTE [2021].VHEL.9-12.B.7.6	1	Identify, balance, and operate centrifuges
CTE [2021].VHEL.9-12.B.7.7	2	Describe the purpose of and how to operate an autoclave
CTE [2021].VHEL.9-12.B.7.8	1	Describe the purpose of and how to operate fume and laminar flow hoods
CTE [2021].VHEL.9-12.B.9.3	2	Separate and characterize proteins (e.g., column chromatography and SDS-PAGE)

**Some items may be tagged to more than one standard.*