Ohio CTE

Health Science Career Field (2021): Principles and Practices of Biomedical Technology (072110)

Bioscience Research and Development: Learners will demonstrate the skills and knowledge of interpreting laboratory requests, using protective clothing and hazardous material containment, specimen collection procedures, a variety of laboratory testing and techniques and maintenance of laboratory equipment and supplies. 5

Outcome 5.1 **Handling, Preparation, Storage and Disposal: Follow standard operating protocols for handling, preparing, storing and disposing of specimens, supplies and equipment.** 5.1

1 Use standard operating procedures for the safe use of instruments, equipment and gas cylinders. 5.1.1

2 Locate and use safety data sheets to prepare and interpret labels for chemicals, supplies, and to identify hazards associated with handling and storing chemical materials. 5.1.2

3 Neutralize acids, bases, or caustic solutions for handling and disposal. 5.1.3

4 Recognize clean room integrity using Standard Operating Procedures (SOPs). 5.1.4

5 Sample, monitor and record the environmental conditions of the facility (e.g. air quality, humidity, temperature, microbial contaminations). 5.1.5

6 Adjust, calibrate, maintain and perform systems diagnostics on laboratory equipment per standard operating procedure (SOP) and equipment specifications. 5.1.6

7 Maintain equipment logs and determine when to perform, implement, or schedule preventive maintenance and/or systems updates. 5.1.7

8 Verify expiration dates and lot numbers. 5.1.8

9 Implement a chemical inventory system that includes all pertinent information regarding stability, hazards and sensitivity per standard operating procedure (SOP). 5.1.9

10 Maintain an inventory system for manufactured products per standard operating procedure (SOP). 5.1.10

11 Maintain separate in-processing, quarantine and release areas. 5.1.11

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12 Monitor and maintain animal behavior, welfare and husbandry per standard operating procedure (SOP). 5.1.12

Outcome 5.8 **Biotechnology Research and Experiments: Conduct a problem-based study, applying scientific methodology and using descriptive statistics to communicate and support predictions and conclusions.** 5.8

1 Identify research problems and structure a statistical experiment, simulation, or study related to the problem. 5.8.1

2 Design a research plan, including the significance of the problem, purpose, variables, hypotheses, objectives, methods of study and a list of materials. 5.8.2

3 Distinguish between dependent, independent and control variables in an experiment. 5.8.3

4 Establish and implement procedures for systematic collection, organization and use of data. 5.8.4

7 Document results of the experiment in a laboratory notebook, adhering to professional protocol. 5.8.7

10 Create, interpret and use tabular and graphical displays and describe the data. 5.8.10

11 Draw conclusions and propose next steps based on observations and data analyses, recognizing that experimental results must be open to the scrutiny of others. 5.8.11

12 Prepare and present findings using scientific reports. 5.8.12