# Competency Task List – Secondary Component

# Biotechnology CIP 26.1201

# High School Graduation Years 2023, 2024, 2025

## 100 Reserved

## 200 Biotechnology Industry

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 201 | Determine the role of biotechnology in today's society. |   |   |
| 202 | Explain the history of biotechnology. |   |   |
| 203 | Describe the lifecycle of biotechnology product development. |   |   |
| 204 | Identify applications of biotechnology. |   |   |
| 205 | Explore careers in biotechnology. |   |   |

## 300 Laboratory Knowledge and Skills

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 301 | Use laboratory equipment. |   |   |
| 302 | Use computer applications to present data. |   |   |
| 303 | Perform basic laboratory math skills. |   |   |
| 304 | Apply statistical analysis to interpret data. |   |   |
| 305 | Apply the scientific method to experimentation. |  |  |
| 306 | Prepare buffers, media and solutions. |  |  |
| 307 | Apply the concepts of recombinant technology. |  |  |
| 308 | Apply the principles of DNA isolation. |  |  |
| 309 | Perform polymerase chain reaction (PCR). |  |  |
| 310 | Perform electrophoresis. |  |  |
| 311 | Perform separation techniques. |  |  |
| 312 | Perform aseptic technique. |  |  |
| 313 | Apply concepts of microbiology. |  |  |
| 314 | Apply cell culture techniques. |  |  |
| 315 | Apply the concept of laboratory automation. |  |  |
| 316 | Perform basic spectrophotometric assays. |  |  |
| 317 | Process biological samples for analysis. |  |  |

## 400 Ethics

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 401 | Investigate bioethics. |   |   |
| 402 | Apply professional ethics. |   |   |

## 500 Safety

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 501 | Follow laboratory safety practices. |   |   |
| 502 | Use personal protective equipment. |   |   |
| 503 | Implement safety protocols. |  |  |
| 504 | Follow Safety Data Sheet (SDS) guidelines for handling, storage, and disposal of hazardous material. |  |  |
| 505 | Identify safety regulatory agencies, such as Occupational Safety and Health Administration (OSHA). |  |  |

## 600 Regulated Environment

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 601 | Perform documentation according to regulatory agency standards. |   |   |
| 602 | Investigate intellectual property laws as they pertain to biotechnology. |   |   |
| 603 | Document lab activities and findings according to guidelines. |   |   |
| 604 | Create, adapt and follow standard operating procedures. |  |  |

## 700 Equipment and Instrumentation

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| Item | Task  | (X) Indicates Proficiency 1 | Secondary Course Crosswalk |
| 701 | Use laboratory glassware. |   |   |
| 702 | Use volumetric equipment (e.g., micropipettes, serological pipettes). |   |   |
| 703 | Use electrophoresis equipment. |   |   |
| 704 | Use spectrophotometer. |   |   |
| 705 | Use balances. |  |  |
| 706 | Useautoclaves. |  |  |
| 707 | Use centrifuges. |  |  |
| 708 | Use pH meters. |  |  |
| 709 | Use thermocyclers. |  |  |
| 710 | Use microscopes. |  |  |
| 711 | Use laminar flow hoods/biological safety cabinets. |  |  |
| 712 | Use temperature regulating devices (e.g., water baths, incubators). |  |  |
| 713 | Use chromatographic equipment. |  |  |
| 714 | Perform calibration of laboratory equipment. |  |  |

1 Student Demonstrated Entry-Level Industry Proficiency as Indicated by (X)

Secondary CTE Instructor Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[PA In-Demand Occupations List (PA IDOL)](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.workstats.dli.pa.gov%2FProducts%2FIDOL%2FPages%2Fdefault.aspx&data=04%7C01%7Celw12%40psu.edu%7C465d2f58a43f45631dac08d9e0349a4c%7C7cf48d453ddb4389a9c1c115526eb52e%7C0%7C0%7C637787338795980555%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000&sdata=yZW%2BaPOFwIBGxV3Jk72%2BGXlAbGWgkjCVKy%2FQtYol1F0%3D&reserved=0)

[Industry-Recognized Credential Resource Guide](https://www.education.pa.gov/K-12/Career%20and%20Technical%20Education/Resources/Teacher%20Resources/IndustryRecognized/Pages/default.aspx)