# Applied Biochemistry Course No. 03203 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Biochemistry (14.1401)

Course Description: **Technical Level:** Includes the reactions, strategy, and regulation of the major metabolic pathways in humans and of selected pathways in plants, and the storage, repair, and transmission of genetic information.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Understand biochemical terms and concepts for living processes, such as cell development, respiration and digestion, and living energy changes such as growth, aging, and death.

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Study physical principles of living cells and organisms and their electrical and mechanical energy, applying methods and knowledge of mathematics, physics, chemistry, and biology. |  |
| 1.2 | Study the chemistry of living processes, such as cell development, respiration and digestion, and living energy changes such as growth, aging, and death. |  |
| 1.3 | Isolate, analyze, and/or synthesize vitamins, hormones, allergens, minerals, and enzymes, and determine their effects on cell functions. |  |
| 1.4 | Examine the molecular and chemical aspects of immune system functioning. |  |
| 1.5 | Research how characteristics of organisms are carried through successive generations. |  |
| 1.6 | Research the chemical effects of substances such as drugs, serums, hormones, and food on tissues and vital processes. |  |
| 1.7 | Investigate the nature, composition, and expression of genes, and research how genetic engineering can impact these processes. |  |
| 1.8 | Design or conduct studies to determine optimal conditions for cell growth, protein production, or protein and virus expression and recovery. |  |
| 1.9 | Read current scientific and trade literature to stay abreast of scientific, industrial, or technological advances. |  |

## Benchmark 2: Understanding and interpreting data and research

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Analyze clinical or survey data using statistical approaches such as longitudinal analysis, mixed effect modeling, logistic regression analyses, and model building techniques. |  |
| 2.2 | Analyze archival data such as birth, death, and disease records. |  |
| 2.3 | Draw conclusions and make predictions based on data summaries or statistical analyses. |  |
| 2.4 | Maintain laboratory notebooks that record research methods, procedures, and results. |  |
| 2.5 | Communicate research results through presentations or project reports. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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