



*Learning Unit Modules*  
*Focused in Integral Professional Competences*

I. GENERAL LEARNING UNIT

| 1. Identification | 2. Code | 3. Semester | 4. Training area |
|-------------------|---------|-------------|------------------|
| Biochemistry      | BBQ08   | Second      | Basic            |

| 5. Mode    |   |                 |              |  |
|------------|---|-----------------|--------------|--|
| Compulsory | X | Elective        |              |  |
| Classroom  | X | Non-Attendance  | Mixed        |  |
| Laboratory | X | Field practices | Guided tours |  |

| 6. Class schedule (hours per week) |          |                   |             |         |
|------------------------------------|----------|-------------------|-------------|---------|
| Theory                             | Practice | Independent study | Total hours | Credits |
| 2                                  | 3        | N/A               | 5           | 5       |

| 7. Person responsible for the subject. |
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| Melissa Bocanegra Salazar              |

II. DATA SPECIFIC LEARNING UNIT

| 8. Objectives   |
|---|
| The student is able to perform systematic study and analysis of biomolecules including their traits and metabolic structures; develops the ability to analyze the processes and signals that coordinate different metabolic states of the cells and their integration into the body. Moreover, the student acquires the ability to synthesize information and Biochemistry own for practical applications in the study of forest ecosystems techniques. |

| 9. Presentation.  |
|---|
| This learning unit is taught in the second semester of Engineering Education Programme in Forest Sciences, falls under the category of Chemical-Biological and Physical-Mathematical Sciences; belongs to the basic science academy and horizontal second semester of ICF.<br>This learning unit provides students with essential concepts and skills of Biochemistry. Its main objective is to provide bio engineer's ability to understand the properties of biomolecules and natural metabolic processes of the cells that will later serve to investigate and boost productivity of forest ecosystems. The student fails to make systematic study and analysis of biomolecules including their traits and metabolic structures. Analyzes processes and signals that coordinate different metabolic states of the cells and their integration into the body. The course provides students with the knowledge and skills necessary to |



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synthesize information and Biochemistry own techniques for practical applications in the study of forest ecosystems

The course is related to other learning units Engineering Education Program in Forestry, giving coherence to the curriculum and the graduate profile consistency. The subject is taught in the second semester and is related directly to matters of Forest Physiology, Forest Nurseries, Forest Soils, Forest Ecology and Forest Genetics.

**10. Professional competences to develop in students.**

| Knowledge  | Skills  | Attitudes  | Values   |
|--|---|--|--|
| <p>Ecological links among beneficial and harmful organisms that make up the ecosystems.</p> <p>Complex ecosystem that provides environmental and economical benefits for society.</p> <p>Interaction between society and forest resources.</p> | <p>Identifying the ecological links among beneficial and harmful organisms that make up the ecosystem.</p> <p>Understanding the ecosystem as a complex that provides environmental and economical benefits for society.</p> <p>Perform investigation of forest aspects, using forest lands as laboratories.</p> | <p>Interest in preserving nature.</p> <p>Collaboration and participation in team works.</p> <p>Interest in self learning and continuous learning.</p> <p>Open to criticism and with availability to accept them.</p> | <p>Respect.</p> <p>Honesty.</p> <p>Responsibility.</p> <p>Commitment.</p> <p>Ethics.</p> |

**11. Course topics**

- Unit I: Introduction and the molecular logic of living beings.
- Unit II: Structural and functional organization of the cell.
- Unit III: Water properties affecting biomolecules.
- Unit IV: Carbohydrates.
- Unit V: Lipids.
- Unit VI: Amino acids, peptides and proteins.
- Unit VII: Enzymes.
- Unit VIII: Nucleic acids.



## 12. Evaluation criteria

Formative evaluation  
Summative evaluation  
Self assessment  
Co-evaluation  
Hetero Evaluation

## 13. Information sources

### Basic

Azcon, B. y M. Talon. 1996. Bioquímica y Fisiología Vegetal. Editorial Interamericana. Mc Graw Hill.

Bradley, Armstrong Frank y Meter, Bennett Thomas. 1982. Bioquímica. Editorial Reverte.

De, Robertis H. 1985. Biología Celular y Molecular, Editorial El Ateneo. 1996. 12ª edición.

Lenhninger, Al. 1975. Bioquímica. Editorial Omega.

Plummer, David T. 1981. Bioquímica práctica. Editorial Mc Graw-Hill Latinoamericana.

Quintero, R. R. Ingeniería Bioquímica. 1990. Editorial Alambra Mexicana, S.A. 1ª. edición.

Stephenson, William K. 1991. Introducción a la Bioquímica. Editorial Limusa.

Toporek, Milton. 1977. Principios de Bioquímica. Editorial Interamericana.

Trudy, Mckee. 2003. Bioquímica: La Base Molecular de la Vida. Editorial Mc Graw Hill.

Voet, E., Voet. 1992. Bioquímica Editorial Omega.

Clark, John M. Bioquímica experimental. Editorial ACRIBIA.

### Complementary

Bruchmann, Ernst-Erich. 1980. Bioquímica técnica. Editorial Acribia.

Ramírez, Bautista Ita Irma. 1999. Biología celular. Editorial Grupo Editorial Éxodo.

Wilson, G. B. y Morrison John H. 1971. Citología. Editorial Continental.