

COURSE COMPACT GUIDE

Course

Course code: BCH 211

Course title & credit unit: Biomolecules (2 UNITS)

Course status: (Core)

Course Duration

Three hours per week for 15 weeks (45hours)

Lecturer Data

Name of the lecturer: Dr Adeyemi, O. S & Mr. Nwonuma C.O.

Qualifications obtained: PhD & M.Sc.

Department: Biological Science

College: College of Science and Engineering

E-mail: nwonuma.charles [@lmu.edu.ng](mailto:nwonuma.charles@lmu.edu.ng)

Office Location: 49/ A 302

Consultation Hours: Monday- Wednesday 2:00pm

Course Content – Illustration below:

Chemistry of amino acids, proteins and their derivatives: methods of isolation and identification. Primary, secondary, tertiary and quaternary structure of proteins. Enzymes, vitamins and coenzymes. Chemistry and structure of nucleic acids.

Course Description – Illustration below:

Amino acids are also energy metabolites and, in animals, many of them are essential nutrients. In addition, as we shall see, many amino acids and their derivatives are of biochemical importance in their own right.

Course Justification – Illustration below:

This to study the structures and properties of the monomeric units of proteins, the amino acids. It is from these substances that proteins are synthesized

Course objectives

At the end of this course, students should be able to:

- (i) *Explain the structures of amino acids*
- (ii) *Identify the classification of amino acid*
- (iii) *Explain the function of amino in the formation of peptides and proteins*
- (iv) *Explain the major function of peptides and proteins*

Course Requirement – Illustration below:

It is required that the students should choose one elective course

Method of Grading- An example below

S/N	Grading	Score (%)
1.	Test	10
2.	Assignment	5
3.	Practical (laboratory work)	15
4.	Final Examination	70
	Total	100

Course Delivery Strategies – Illustration below:

Lecture and Collaboration method complimented with laboratory work will be adopted.

LECTURE CONTENT

For this section- the lecturer provides the topic of each week, objectives, description, study question and other information posted below.

➤ **Week 1 & 2: Chemistry of amino acids**

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should be able to:

- i. Explain the classifications of amino acid based on the R-group
- ii. Draw the structures of the 20 common amino acids
- iii. Give

➤ **Description**

First hour: Explain the classification of the 20 common amino acids

Second hour: Show the chemical structure of each of the amino acids

Third hour: Discuss the uncommon amino acids

➤ **Study Question: This section entails study question for the week lecture.**

- i. Classify the 20-common amino acid based on their R group
- ii. Give other classification of the 20 common amino acids
- iii. Explain the use of uncommon amino acids in the body

➤ **Reading List - Books and materials students can read. Illustration below:**

Murray, R.K., Granner, D.K., Mayes, P. A. and Rodwell, V. W. (2003) twenty-sixth edition. McGraw-Hill companies limited.

Nelson, D. L. and Cox, M. M. (2004) Lehninger Principles of Biochemistry. 4th edition. Worth Publishers, New York.

Reginald H. Garrett and Charles M. Grisham (2007) Biochemistry third edition. Thomson Learning, Inc.

➤ **Week 3 & 4: proteins and their derivatives:**

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should be able to:

- iv. Describe amino acid sequence
- v. Describe the structure and chemistry of thyroid and parathyroid
- vi. Explain the functions and site of its action

➤ **Description**

First hour: Explain the relationship between amino acids, peptide and proteins

Second hour: identify the physiological peptides and proteins

Third hour: Explain the functions of proteins

➤ **Study Question: This section entails study question for the week lecture.**

- iv. Why are protein referred to as polypeptides?
- v. Describe the nature of bond in peptides and proteins
- vi. What are the functions of proteins?

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➤ **Week 5 & 6: methods of isolation and identification.**

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should be able to:

- vii. Know the various methods of isolation of proteins
- viii. Explain the method of identification of amino acids

➤ **Description**

First hour: Explain the methods of isolation of proteins from tissue

Second hour: Explain various assay and method of identification of proteins and amino acids

Third hour:

➤ **Study Question: This section entails study question for the week lecture.**

- vii. Mention methods of protein isolation from liver
- viii. What are precaution to observe in isolation of proteins
- ix. Explain the purification of proteins
- x. What is amino acid sequencing of a peptide chain?
- xi. What is acid hydrolysis
- xii. Explain the sanger method

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➤ **Week 5 & 6:** Primary, secondary, tertiary and quaternary structure of proteins

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should be able to:

- ix. Distinguish between the different types of protein structure
- x. Describe the various bond responsible for each protein structure
- xi. Explain where each structure can be found

➤ **Description**

First hour: Explain primary and secondary structure of protein

Second hour: Explain the tertiary and quaternary structure of protein

Third hour: Explain the bonds involved in the structures and the relevant in their function

➤ **Study Question: This section entails study question for the week lecture.**

- i. Mention the structures of proteins
- ii. Describe the relevant bonds for each of the structures

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Guyton, Arthur C. Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed. p. ; cm. Includes bibliographical references and index.

ISBN 0-7216-0240-1 Harper medical textbook Harper's Illustrated Biochemistry, Twenty-Sixth Edition

➤ **Week 7 & 8:** Enzymes, vitamins and coenzymes.

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should be able to:

- iii. Differentiate Enzymes from other proteins
- iv. Know the two proposed models of how enzymes fit to their specific substrate and classification of enzymes
- v. Know types of enzymes and their function as coenzymes
- vi. Know the functions of coenzyme in enzyme functions

➤ **Description**

First hour: Explain the function of enzyme in catalysis

Second hour: Describe the structure of some enzyme and their role as coenzyme

Third hour: Explain the relationship between coenzyme and Co-factor

➤ **Study Question: This section entails study question for the week lecture.**

- i. Mention the two model that explain how enzyme fit into its active site
- ii. Mention and explain the classification of enzymes
- iii. Explain the function of cofactors and coenzyme in enzyme catalysis

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➤ **Week 9 & 10 :** *Chemistry and structure of nucleic acids.*

➤ **Objectives (list the objectives)**

The students at the end of the lectures for the week should :

- iv. Explain the difference between *Nucleotides, Nucleosides, and Bases*
- v. Know the chemical structure each of the base
- vi. Mention the function of nucleotide in gene

Description

First hour: Explain the chemistry of the base and their structures

Second hour: Explain the relationship between the bases and nucleoside

Third hour,: Explain the relationship between the bases and nucleotide

➤ **Study Question: This section entails study question for the week lecture.**

- i. What is the role of genes in protein synthesis
- ii. Mention the nucleic acid bases
- iii. What is the relationship between the base sequence in the protein synthesis

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Nelson, D. L. and Cox, M. M. (2004) Lehninger Principles of Biochemistry. 4th edition. Worth Publishers, New York.

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HOD's COMMENTS:

Name: _____ Signature _____ Date: _____

