| THOMAS ADEWUMI UNIVERSITY<br><br>COURSE OUTLINE | |
|---|---|
| Faculty | Computing and Applied Sciences |
| Department | Biological Science |
| Course Title | **LIPID METABOLISM** |
| Year of Study | 3 |
| Course Code | BCH 301 |
| Credit Hours | 2 |
| Contact Hours | 30 |
| Mode of Delivery | Classroom Lectures |
| Mode of Assessment | Weight% |
| Continuous Assessment | 40% |
| Final Examination | 60% |
| Total | 100% |
| Course Lecturer and Instructor(s) | Dr A.T. Bamigbade |
| Course Description | There are four basic macromolecules of life viz: nucleic acids, carbohydrates, proteins, lipids. This aspect of biochemistry is focused on not only on the synthesis, catabolism and regulation of lipid metabolism but also on various classification of lipids, what kinds of lipids are found in the major body fluid-blood- and phospholipid bilayer of biological membrane amongst others. This course, for a biochemistry student is important to both expose them to lipid biology and stimulate their interest in further research in the field |
| Course Objective and | This course would enable the understanding of the following:<br>1. The various classes of lipids<br>2. General *de novo* (intracellular) biosynthesis of several classes of lipids<br>3. Regulation of lipid metabolism<br>4. Application of relevant select groups of lipids both clinically and industrially |

| | |
|---|---|
| Learning Outcomes | By the end of the course, students will be able to:<br>1. Define lipid metabolism<br>2. Group lipids into various classes<br>3. Explain in detail the Nicolson and Singer theory of membrane phospholipid bilayer<br>4. Comprehend the term metabolism as the overall synthesis and degradation of biological macromolecule and further know the relevance of regulation in Biochemistry<br>5. Give an overview of lipid metabolism from a clear perspective<br>6. Highlight the various application of relevant select groups of lipids both clinically and industrially |
| Teaching and Learning | The class will meet for 2 hours each week. Class time will be used for a combination of lecture, classwork and tutorials |
| Detailed Course Content | Classification of lipids, Blood lipids and the lipoprotein system. Lipid micelles, monolayers and bilayers; Oxidation of fats, general biosynthesis of lipids, phospholipids and sphingo-lipids, unsaturated and essential fatty acids, adipose tissue, regulation of the metabolism of fats, ketosis, cholesterol metabolism. Industrial and clinical application of glycolipids, leucotrienes, prostaglandins and thromboxanes. |

Course Content Sequencing

| Weeks | Detailed Course Outline | Allowed Time |
|---|---|---|
| Week1 | **1. Introductory explanation of the term lipid metabolism and classification of lipids**<br>• Anabolism<br>• Catabolism | 4 Hours |
| Week2,3,4 | **2. Explain in detail and give examples of :**<br>• Blood lipids<br>• Lipoprotein system.<br>**3. Nicolson and Singer theory of membrane phospholipid bilayer**<br>**4. Continuous assessment I** | 6 Hours |
| Week 5,6, | 5. Oxidation of fats<br>• Alpha oxidation | 4 Hours |

| | | |
|---|---|---|
| | • Beta oxidation | |
| Weeks7,8,9 | **6. General biosynthesis of representative member of diverse classes of lipids**<br>• Simple lipids such as fat and waxes<br>• Complex lipids such as phospholipids, glycolipids, sphingolipid, terpernes | 10 Hours |
| Week10,11,12 | 7. Regulation of the metabolism of fats, ketosis, cholesterol metabolism and applications of lipids<br>8. Continuous Assessment II | 6 Hours |
| After Week 12 | 9. Examinations | |

Recommended Reading Material


1. Reginald Garrett and Charles Grisham (2010). Biochemistry. Brooks/Cole, Cengage Learning
2. David Nelson and Michael Cox (2016 ). Principles of Biochemistry. McGrawHill education
3. Victor Rodwell, David Bender, Kathleen Botham, Peter Kennelly, and Anthony Weil (2018). Harper's Illustrated Biochemistry. McGrawHill education lange


**Course Code**: BCH 301
**Course Title**: Lipid Metabolism

**Preamble**: There are four basic macromolecules of life viz: nucleic acids, carbohydrates, proteins, lipids. This aspect of biochemistry is focused on not only on the synthesis, catabolism and regulation of lipid metabolism but also on various classification of lipids, what kinds of lipids are found in the major body fluid-blood- and phospholipid bilayer of biological membrane amongst others. This course, for a biochemistry student is important to both expose them to lipid biology and stimulate their interest in further research in the field

**Specific Course Objective/Learning Outcomes**

This course would enable the understanding of the following:

1. The various classes of lipids
2. General *de novo* (intracellular) biosynthesis of several classes of lipids
3. Regulation of lipid metabolism
4. Application of relevant select groups of lipids both clinically and industrially

**A. Learning Activities/ Course Delivery Methods**

**1. Lectures: Detailed content of course are taught in class**

**Course Content:** Classification of lipids, Blood lipids and the lipoprotein system. Lipid micelles, monolayers and bilayers; Oxidation of fats, general biosynthesis of lipids, phospholipids and sphingo-lipids, unsaturated and essential fatty acids, adipose tissue, regulation of the metabolism of fats, ketosis, cholesterol metabolism. Industrial and clinical application of glycolipids, leucotrienes, prostaglandins and thromboxanes.