BCH 507- Industrial Biochemistry

COURSE PARTICULARS

Course Code: BCH 507
Course Title: Industrial Biochemistry
No. of Units: 3
Course Duration: Three hours of theory per week for 15 weeks.
Status: Compulsory
Course Email Address: bch507@futa.edu.ng
Course Webpage: http://www.bch.futa.edu.ng/courseschedule.php?bch507=BCH%20204
Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

BCH 507 is a theoretical course aimed at giving the industrial application of biochemistry especially in the food and pharmaceutical industries. The course outline includes short review of microbial physiology and genetics, review of general metabolic pathway, control and application in industrial processes, continuous culture methods, principles and applications, the chemostat and its application in industrial fermentations, fermentations-alcoholic, amino acids, antibiotics and its and other secondary metabolites, primary and secondary metabolism, process evaluation and development, over production of metabolites – amino acids, taste enhancers, organisms of industrial importance, induction of mutation in microorganisms and plants for the purpose of over production, strain selection/development and enhancement, gene dosage and its application in industrial processes.
COURSE OBJECTIVES

The objectives of this course are to:

- To equip students with a basic understanding of industrial biochemical systems and processes necessary for production of products with commercial value; and
- afford students opportunity to appreciate the use of microorganisms in the production of products such as foods, drinks, pharmaceuticals and medical compounds e.g. antibiotics, hormones, solvents, organic acids and enzymes that have direct economic values.

COURSE LEARNING OUTCOMES / COMPETENCIES

The course is an applied one. Thus, students are expected to have gained the concept of industrial relevance of Biochemistry in the fields of food, pharmaceuticals and medicine upon successful completion of the course.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class Attendance</td>
<td>05%</td>
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<tr>
<td>Quiz/Assignments</td>
<td>15%</td>
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<tr>
<td>Mid-Semester Test</td>
<td>20%</td>
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<tr>
<td>Examination</td>
<td>60%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
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GENERAL INSTRUCTIONS

*Attendance:* Students are expected to be in class for lectures. Attendance records will be kept and used to determine each person’s qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with either of the Lecturers, indicating the reason for the absence.

*Use of Mobile devices:* Students are expected to switch off their mobile phones in class to avoid unnecessary distractions.

*Communication between students:* Students are not allowed to talk or make noise during the lectures. Students who are interested in making a point or asking questions should put up their hands so that the lecturers in charge can call the students to talk.

*Academic Integrity:* Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person’s work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in
accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

**Assignments and Group Work:** Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified either of the Lecturers in advance, will late submission of assignments be permitted.

**READING LIST**

The recommended reading will include but not limited to the following text books.


**Legend**

1- Available in the University Library
2- Available in Departmental/School Libraries
3- Available on the Internet.
4- Available as Personal Collection
5- Available in local bookshops.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Remarks</th>
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| 1&2  | Module I  
  - A short review of microbial physiology and genetics.  
  - A review of general metabolic pathway, control and application in industrial processes. | Students will be taught the roles of microbes in the production of various industrial products. |
| 3 – 6 | Module II  
  - Continuous culture methods, principles and applications. The chemostat and its application in industrial fermentations;  
  - Fermentations-alcoholic, amino acids, antibiotics and its and other secondary metabolites. | Students will be given term paper on the production of a local condiments of their choice. |
| 7 & 8 | Module III  
  - Primary and secondary metabolism.  
  Process evaluation and development. | MID-SEMESTER TEST |
| 9 & 10 | Module IV | Over production of metabolites – amino acids, taste enhancers, organisms of industrial importance. |
| 11 & 12 | Module V | Induction of mutation in micro-organisms and plants for the purpose of over production |
| 13 & 14 | Module VI  
Strain selection/development and enhancement. Gene dosage and its application in industrial processes | Students will be given assignment on the strain improvement of a microorganism of their choice. |
| 15     | Revision                      | Revision of the entire course |