Course Specifications

Programme(s) on which the course is given: M.Sc.
Major or minor element of programmes: Major
Department offering the programme: Botany
Department offering the course: Botany
Academic year / Level: One year
Date of specification approval: 2012

A- Basic Information

Title:Microbial Physiology **Code: B582, B 682**
Credit Hours: 3h **Lecture: 2h**
Tutorial: 0 **Practical:2h** **Total: 4h**

Teaching staff: **Prof. Mohammed Ali. Hefnawy**

B- Professional Information

1 – Overall aims of course

This course aims to give knowledge on microbial cell composition and cell constituents biosynthesis**.** Cell wall composition, plasma membrane composition, Biosynthesis of amino acids, phospholipids and plasma membrane, biosynthesis of cell wall. This course also provides understanding of the role of microbes in the environment and biodegradation

2 – Intended learning outcomes of course (ILOs)

a- Knowledge and understanding:

The student should be able to:

a1- Define the chemistry of microbial cell, nutritional requirements
a2- Illustrate the growth conditions and stress response.
a3- Explain the **Biosynthesis of amino acids, phospholipids and plasma membrane, biosynthesis of cell wall**
a4- the role of microbes in the environment and biodegradation

b- Intellectual skills

After completing the course, the student should be able to:

b1- Descrimenate between chemical composition of cell wall, plasma membrane and other organelles of microbial cells
b2- Conclude the **Biosynthesis of amino acids, phospholipids and plasma membrane, biosynthesis of cell wall**.
b3- Manipulate the role of microorganisms in the environment and biodegradation

c- Professional and practical skills

The student should be able to:

c1- Use some lab tools required for cultivation of different microbes and evaluation of growth criteria such as autoclave, inoculation procedures, oven, heamacytometer ..etc.

c2- Use some lab tools required for certain biochemical analysis such as centrifuge and spectrophotometer

c3- Demonstrate skills **for determine protein , lipid, carbohydrates, amino acids and fatty acids**

General and transferable skills

The student will be able to:

d1- Write scientific essay.

d2- Present reports in group meetings.

3- Contents

Topic	**No. of hours**	**Lecture**	**Tutorial/ Practical**
1- Course description and introduction 2- The growth of different microbes and methods of estimating growth	4	2	2
3- The chemical and physical environment affecting growth	4	2	4
4- biosynthesis of amino acids	4	2	2
5- plasma membrane composition and isolation. Chemical determination of membrane constituents	4	2	2
6- Plasm membrane biosynthesis and phospholipid biosynthesis	4	2	4
7- cell wall composition and biosynthesis	4	2	2
8- Biosynthesis of macromolecules in fungi	2	1	2
9- Fungal growth responses and mechanisms of tolerance to extreme environments (temperature, salinity and toxicants)	4	2	2

4– Teaching and learning methods

4.1- Lectures

4.2- Practical experimentations

4.3- Information collection and presentation

5- Student assessment methods

5.1 **Mid term written Exam** to assess understanding and intellectual competencies.

5.**2 Mid term practical Exam** to assess practical competency.

5.3 **Semester activities** to assess attendance and presentation.

5.4 **Final term practical Exam** to assess professionalism.

5.5 **Final term written exam** to assess knowledge reporting and comprehension.

Assessment schedule

Assessment 1 Mid term	Week 7
Assessment 2 Semester activities	Week 10 and 11
Assessment 3 Final term practical exam	Week 13
Assessment 4 Final term written exam	Week 14

Weighting of assessments

Mid-Term Examination (written + practical)	20 %
Final-term Examination (written + practical)	60 %
Semester Work (attendance and presentations)	20 %
Total	100%

6- List of references

6.1- Course notes

Prepared notes describe the outline of the lectures are handed out to the students

6.2- Essential books (text books)

6.3- Recommended books

KETTRIDGE, S. (1976). Transport and translocation in filamentous fungi. In The filamentous fungi (Smith, J. and Berry, D. eds). Pp 32-60. Edward Arnold.

Deacon, J. W. (1984). Introduction to modern mycology, Basic Microbiology (vol. 7) (Wilkinson, J. F., ed), Blackwell scientific publication, Oxford.

6.4- Web sites http;//www.fungi.htm; www.fig.cox.miami.edu/

7- Facilities required for teaching and learning

Teaching theater, computer and data show; labs equipped with autoclave, incubators, fridge, ovens, laminar flow, light microscopes, fermentor, centrifuge, spectrophotometer, heamacytometers; specimens, chemicals and glasswares required for preparation of growth media and physiological studies.

Course coordinator: Prof. Mohammed Ali Hefnawy

Head of Department: Prof. Mohammed Ali Hefnawy

Date: / /