University : Mansoura University

Faculty : Faculty of Pharmacy

Department :

1- Course data :-

Code:	PG519					
Course title:	Technology of natural drugs					
Level:	Five					
Program Title:	• pharmaceutical sciences					
Specialization:	Major					
Teaching Hours:	**Theoretical:**	1	**Tutorial:**		**Practical:**	

2- Course aims :-

1. Provides student with the basic concepts of plant tissue culture technique and its application in the area of production of plant secondary metabolites
2. Be aware with the concept of microbial biotransformation
3. Apply biotransformation reactions for converting natural drug to more active metabolites

3- Intended learning outcomes of course (ILO'S) :-

a- Knowledge and understanding

1. [a13] Describe the role of genomics and biotechnology in the discovery of new remedies
    - a13.1-List the raw materials used in different culture media and sterilization techniques
    - a13.2-Understand different techniques and applications of plant tissue culture and microbial biotransformation
    - a13.3-Know the basic application of genetic engineering in pharmaceutical industry

b- Intellectual skills

1. [b21] Illustrate the principles of plant tissue culture and biotransformation techniques and their applications in the production of bioactive compounds.
    - b21.1-Apply how biotechnology explain PTC technology and the diversity of microbial world in drugs production
    - b21.2-Outline different substances produced by microbial biotransformation and PTC
    - b21.3-Report some pharmaceutical products produced by PTC and MT

c- Professional and practical skills

1. [c21] Apply plant tissue culture and biotransformation techniques in the production of valuable products.
    - c21.1-Operate both cultures and fermenters
    - c21.2-Isolate and identify metabolites produced by PTC and MT
    - c21.3-Report the status of cultures and fermenters

d- General and transferable skills

1. [d3] Interact effectively in team working.
    - d3.1-Work effectively in a team.
2. [d8] Present information clearly in written, electronic and oral forms.
    - d8.1-Communicate clearly in written, electronic and oral forms

4- Course contents :-

No	Topics	Week
1	Introduction to Biotechnology and its Application in Pharmacognosy	1
2	Principles of microbial transformation	2
3	Methods of microbial transformation	3
4	Application of microbial transformation	4
5	Future of microbial transformation	5
6	Introduction to Plant Tissue culture	6
7	Culture Tools and Techniques	7

8	Culture Types	8
9	Application of Plant Tissue Culture	9
10	Control of secondary Metabolites Production	10

5- Teaching and learning methods :-

S	Method	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Lectures using white board and data show.	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3		d3.1,d8.1
2	Research assignments	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1

6- Teaching and learning methods of disables :-

1. Non

7- Student assessment :-

a- Student assessment methods

No	Assessment Method	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Written exam	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1
2	Oral exam	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1

b- Assessment schedule

No	Method	Week
1	Mid-Term	7
2	Written	15
3	Oral	15

c- Weighting of assessments

No	Method	Weight
1	Mid_term examination	10
2	Final_term examination	75
3	Oral examination	15
4	Practical examination	
5	Semester work	
6	Other types of asessment	
Total		100%

8- List of references

S	Item	Type
1	Notes by staff members of pharmacognosy department	Course notes

9- Matrix of knowledge and skills of the course

S	Course contents	Knowledge and understanding	Intellectual skills	Professional skills	General skills
1	Introduction to Biotechnology and its Application in Pharmacognosy	a13.3	b21.1		d8.1
2	Principles of microbial transformation	a13.1,a13.3	b21.1		d8.1
3	Methods of microbial transformation	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d8.1
4	Application of microbial transformation	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1
5	Future of microbial transformation	a13.2	b21.2		d8.1
6	Introduction to Plant Tissue culture	a13.1	b21.1		d8.1
7	Culture Tools and Techniques	a13.1	b21.1	c21.1	d8.1
8	Culture Types	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1
9	Application of Plant Tissue Culture	a13.1,a13.2,a13.3	b21.1,b21.2,b21.3	c21.1,c21.2,c21.3	d3.1,d8.1
10	Control of secondary Metabolites Production	a13.1	b21.2,b21.3	c21.2	d8.1

Course Coordinator(s): -

Farid AbdelRehim AbdelAziz Badria

Head of department: -