**University** Benha **Faculty** Agriculture

**Course specifications**

**Programs on which the course is given:** Agricultural Biotechnology, Food safety and Agribusiness

**Major or minor element of programmes:** Major

**Department offering the programme:** General

**Department offering the course: Soil and water science**

**Academic Level/semester:**3rdlevel/2ndsemester(Agric.Biotechnology) 2nd/1st (Agribusiness) 1st /2nd(Food safety)

**Date of specification approval: May 2014**

**A- Basic Information**

**Title:** Bio-Organo Fertilization **Code: SO 0504**

**Weekly Teaching Hours Lecture:** 28hours **Practical or** tutorial**:** 28hours **Total:** 56 hours

**B- Professional Information**

**1 – Overall aims of course**

Make students aware of importance and needs for utilizing organic manuring and enhancing soil biological activities for crop production . Different methods and techniques of manure preparation are presented. Mechanisms and organisms involved in fermentation and composting are covered. Materials used for composting and their suitability are assessed. Bio-fertilization and bio-fertilizers are included.

**2 – Intended learning outcomes of course (ILOs)**

**a- Knowledge and understanding**:

a1- state organic and microbial manures and importance in organic farming.

a2- define and categorize composts.

a3.relate soil microbiology and microbial biomass to soil fertility.

a.4.illustrate response assessment to manuring and bio-manuring.

**b- Intellectual skills.**

b1-Compare soil bio-fertilizers and organic ones.

b2-Contrast different categories of bio-organo fertilizations.

b3-Classify bio-fertilizers and organic manures.

**c- Professional and practical skills**

c1- Judge, evaluate and recognize bio and organic fertilizers..

c2-Conclude advantages and disadvantages of organic farming regarding manuring.

c3- Select criteria for evaluation of fertilization methods.

c4- Assess reports on fertilization of different crops.

**d- General and transferable skills**

d1- Effective work in problem-solving groups.

d2- Use computer soft-ware in analysis operations.

d3- Access to the Web-site on organo-biofertilization aspects.

d4- Solving problems through the scientific avenues.

**3- Contents:**

**Theoretical part :**

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| Lectures | Hours | Topic |
| 1 | 2 | Introduction to fertilization and manuring. |
| 1 | 2 | Organic materials including farm residues as nutrient sources.  |
| 1 | 2 | Organic manures |
| 1 | 2 | Compost production and methods of composting |
| 1 | 2 | Commercial composts and their evaluation |
| 1 | 2 | Microorganisms as biofertilizers and plant nutrient providers. |
| 1 | 2 | Classification of biofertilizers .  |
| 1 | 2 | Soil conditions affecting biofertilization.. |
| 1 | 2 | Organic soil amendments and their comparative efficiency |
| 1 | 2 | Potential hazards of some organic fertilizers. |
| 1 | 2 | Remediation of hazards if occurred.  |
| 1 | 2 | Parameters for balanced bio-organo fertilization practices. |
| 1 | 2 | Options For the Future |
| 1 | 2 | Overall Revision on the course |

**Practical part :**

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| **Sessions** | Hours | **Topic** |
| 1 | 2 | Specimens of organic manure and fertilizers  |
| 1 | 2 | Practical Demonstration on application of manures.  |
| 1 | 2 | Manure sampling.. |
| 1 | 2 | Determination on application methods of organic manures  |
| 1 | 2 | Initiation of pot experiments on bio-organic manuring. |
| 1 | 2 | Physical analysis of organic fertilizers. |
| 1 | 2 | Determination of Total contents of organic substances as manures. |
| 1 | 2 | Determination of available nutrients in organic manures. |
| 1 | 2 | Excursion for Organic soil Amendment of Compost-making and Biogas |
| 1 | 2 | Assessment of N,P and K bio-fertilizers as nutrient providers for plants. |
| 1 | 2 | Mathematical approach for balanced bio-organo fertilization.  |
| 1 | 2 | Conclusive assessment of results of conducted pot experiments. |
| 1 | 2 | Over all revision on bio-organo fertilization. |
| 1 | 2 | General Revision |

**4– Teaching and learning methods**

4.1- Lectures

4.2-Assignments

4.3-Tutorials and written case-solving exercise.

4.4-Excursions

4.5-Practical,Laboratory and Greenhouse work

**5- Student assessment methods**

5.1:Semester performance to assess, understanding and skills

5.2 :Follow-up and Practical exams to assess knowledge and practical skills

5.3: Oral exam to assess intellectual , and transferable skills

5.4 Final exam to assess comprehension and intellectual skills **Assessment schedule**

Assessment 1 Semester performance exams Weeks 8th and 12th.

Assessment 2 Practical exam Week 15th.

Assessment 3 Oral exam Week 15th.

Assessment 4 Semester Terminal Week 16th.

**Weighing of assessments**

Follow-up & Practical exams 30% (follow-up, Mid-term and practical)

Oral exam. 10 %

Semester Terminal Exam 60%

Total 100%

**Any formative-only assessment(s) to be described**

**6- List of references**

6.1- Course notes: Specialized notes and paragraphs by teaching staff.

6.2-Text books: **Kanniyan, S. 2002.** Biotechnology of biofertilizers. Kluwer Acad. Publ., Dordrecht, Netherlands.

**Fossel, P.V. 2007.** Organic farming: Everything you need to know. Voyageur Press, St. Paul, MN, USA.

**7- Facilities required for teaching and learning**

Transportation methods for site visits and scientific excursions,

white board and board ink-marker, data-show, laboratory specimens of studied subjects, pipettes glassware filter paper, chemicals**,** flame emission spectrometry, reference materials, refrigerators, gloves, masks, chemicals.

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| **Matrix for Organo-biofertilization course (Lecture Theoretical part)** |
| d | c | b | a | Lectures |
| D4 | d3 | d2 | d1 | c4 | c3 | c2 | c1 | b3 | b2 | b1 | a4 | a3 | a2 | a1 |
|  |  |  | x |  |  |  | x |  |  | x |  |  |  | x | Introduction to fertilization and manuring. |
| x |  | x |  |  |  |  | x |  |  | x |  | x |  | x | Organic materials including farm residues as nutrient sources.  |
|  |  | x |  | x |  |  |  | x |  |  |  |  | x | x | Organic manures |
| x |  |  | x |  |  | x |  |  |  | x |  |  |  | x | Compost production and methods of composting |
|  |  | x |  |  |  | x |  |  |  | x |  |  | x | x | Commercial composts and their evaluation |
|  | x | x |  | x |  |  |  |  | x |  |  |  |  |  | Microorganisms as biofertilizers and plant nutrient providers. |
| x |  |  | x |  | x |  |  | x |  |  |  |  | x |  | Classification of biofertilizers .  |
| x | x | x | x |  |  | x |  |  |  |  |  | x |  |  | Soil conditions affecting biofertilization.. |
| x | x | x | x |  | x | x |  |  | x |  |  | x |  | x | Organic soil amendments and their comparative efficiency |
| x | x | x | x | x | x | x | x | x | x | x |  | x | x | x | Potential hazards of some organic fertilizers. |
| x | x |  |  |  | x |  | x |  | x |  | x |  |  | x | Remediation of hazards if occurred.  |
| x | x | x | x |  |  | x |  |  |  | x | x |  |  |  | Parameters for balanced bio-organo fertilization practices. |
|  | x | x |  | x |  |  |  | x |  |  | x |  |  |  | Options For the Future |
| x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | Overall Revision on Water Science |

**Course coordinators: Ass. Prof Dr.Omar Elhosainy ,Ass. Prof. Mohmd H. Hamza**

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| **Matrix for Organo-biofertilization course (Practical part)** |
| **d** | **c** | **b** | **a** | **Practicals** |
| d 4 | d3 | D2 | d1 | c 4 | c 3 | c 2 | c1 | b 3 | b 2 | b1 | a 4 | a 3 | a 2 | a1 |
|  |  |  | x |  |  |  | x |  |  |  |  |  |  | x | **Specimens of organic manure and fertilizers**  |
|  |  | x |  |  |  | x |  | x |  |  | x |  |  | x | **Practical Demonstration on application of manures.**  |
| x | x |  |  |  | x |  |  |  |  |  |  | x |  |  | **Manure sampling..** |
|  |  | x |  |  |  | x |  | x |  |  |  |  | x |  | **Determination on application methods of organic manures**  |
| x | x |  |  |  |  | x |  |  |  |  |  |  |  |  | **Initiation of pot experiments on bio-organic manuring.** |
|  | x |  |  |  |  |  |  |  | x |  |  |  |  |  | **Physical analysis of organic fertilizers.** |
| x | x | x |  | x |  | x | x |  |  |  |  |  |  |  | **Determination of Total contents of organic substances as manures.** |
|  | x | x |  |  | x |  | x |  |  |  |  |  |  | x | **Determination of available nutrients in organic manures.** |
|  |  |  | x |  |  |  | x |  |  |  |  |  |  | x | **Excursion for Organic soil Amendment of Compost-making and Biogas** |
| x | x |  | x | x |  |  | x | x |  |  |  |  |  | x | **Assessment of N,P and K bio-fertilizers as nutrient providers for plants.** |
| x |  |  | x |  | x |  |  |  |  |  | x |  |  |  | **Mathematical approach for balanced bio-organo fertilization.**  |
| x | x | x |  | x | x |  |  |  |  |  | x |  |  |  | **Conclusive assessment of results of conducted pot experiments.** |
| x | x | x |  | x |  |  |  | x |  |  |  |  |  | x | **Over all revision on bio-organo fertilization.** |
| x | x | x |  | x | x | x | x | x | x | x | x | x | x | x | **General Revision** |

**Head of Department:** Prof Dr. Abo-El-Nasr Hashem Abdel-Hamid. **Date:**