



**Tentative Course Plan**  
**DEPARTMENT OF BOTANY**

**Class: BS (BOTANY)**

**Semester- 8th**

**Session: (2016-20)**

<b>Instructor</b>	<b>Dr. Nargis Naz</b>	<b>Email: nargis.naz@iub.edu.pk</b>	
<b>Course Title</b>	<b>Mycorrhiza</b>	<b>Program</b>	<b>BS</b>
<b>Course Number</b>	<b>BOTA-01802</b>	<b>Credit Hours</b>	<b>4(2+2)</b>
<b>Lecture</b>	Monday to Thursday: period (08:30a.m to 03: 30p.m), Room# 00		

**Course Objective:**

Sustainable land use requires that soil management practices be adopted to conserve and augment soil resources. Arbuscular mycorrhizal fungi (AMF) are important in the soil ecosystem as a key link between plants and soil, mediating many interactions. The effects of mycorrhizas in agriculture, horticulture and land-reclamation are almost exclusively beneficial. There is increasing evidence that AMF can enhance crop productivity in the field, and they are also important in the way crops respond to fertilisation regimes. Direct inoculation of AMF is currently limited to small-scale, high value crops, and there is scarce information on large-scale field inoculations, partially due to the fact that these fungi are obligate symbionts which hinders production of inoculum. The main **objective** of the **course** is to impart hands-on **training** in research techniques on **mycorrhizal** research so that the participants can apply them in their research programmes.

**Methods of Teaching**

- Assigned readings
- Group activities & Discussion
- Audiovisual aids lectures
- Web-assisted instruction
- Student-Directed Teaching

Resource Material	1.	Kader, J. C. Delseny, M. 2011. Advances in Botanical Research, Volume 60. Wageningen Academic Publisher.
	2.	Thangadurai, D., Busso, C. A., Mohammed H. 2010. Mycorrhizal Biotechnology. Science Publishers.
	3.	Mukerji, K. G. Rajeev, H. U., Chamola, O B. P., Deuby, P. 2009. Integrated Pest and Disease Management. Kluwer Academic Publisher.

3.Research Papers		5.Web Resources	
i		i	
ii		ii	
4.Hot Research Papers		5.Web Resources	
i		i	
ii		ii	

**Office Help Hours** Monday, \_ Friday: 01:00-02:00 pm

**Grading** Exam (Date to be announced)  
Mid- Exam (30%) Final Exam (50%)  
Problem Session/Assignments (20%)

**Problem Session** .....day: 00 and 00 periods (0:00-00:00am), Room# 00

**SEQUENCE OF TOPICS TO BE COVERED**

Session #	Topics (outline of main topics and sub topics)	Chapter #	Tutorial /Laboratory
1	Introduction to Course contents		
2 & 3	Classification of Fungi		Field trip for isolation & AMF from different agro-systems
4 & 5	Types of mycorrhiza		Extraction and identification of AM

			spores from the rhizosphere soils
5 & 6	contribution of AMF in the health of plant and soil		
7 & 8	The symbioses forming arbuscular mycorrhizas		-
9 & 10	Fossil history of AMF		
11 & 12	General biology and development of AM fungi		
13 & 14	Sources of inoculum, germination and hyphal growth		
15	Mid Term Exam	Course/Discussion from session 1 to 14	
16 & 17	Morphology and anatomy of arbuscular mycorrhizas		Study of morphology and specific structures of AM mycorrhizas in roots
18 & 19	Establishment of colonization and extent of colonization		Pure culturing of mycorrhiza through inoculation
20 & 21	Water relations of mycorrhizal Plants		-
22 & 23	Ecology of endo and ecto mycorrhiza		-
24 & 25	Structure and formation of ectomycorrhizal roots		-
26 & 27	Contribution of mycorrhiza to phytoremediation		-
28 & 29	Contribution of mycorrhiza in Agriculture		-
30	Final Term Exam	Course/Discussion from session 1- 29	

Student Evaluation criteria:

Attendance	5%
Workshop / Assignments/Case study	5%
Surprise Test/Sudden Test , Quizzes	5%
Class Participation	5%
Mid Term Paper	30%
Final Term paper	50%
Total	100%

Student Responsibilities:

Students must attend class. Failure to attend class may result in failure in the course. Students must also arrive on time and remain in class for the entire period. Cellular Phones and Beeper must be Turned off (Proper classroom decorum [behavior] adopts, Course outlines and calendars explain requirements and assignments, students are responsible for knowing what they say. Students are also responsible for doing all assigned work on time. Excessive absences (more than 03) will result in “F Grade”. Students may prepare Sketchbook for taking notes and for references.

Instructor/Tutor

Approved by:

Dean/ Chairman/ HOD/ Subject Specialist/ Program Coordinator