

# The Islamia University of Bahawalpur

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## Tentative Course Plan

DEPARTMENT OF BOTANY

Semester-7th (Botany)

Class: BS Botany

Session: 2016-20

<b>Instructor</b>	<b>Ghulam Sarwar</b>	<b>Email:</b> <a href="mailto:lifesci.flora786@gmail.com">lifesci.flora786@gmail.com</a>	
<b>Course Title</b>	<b>Introduction to Biotechnology</b>	<b>Program</b>	<b>BS Botany</b>
<b>Course Number</b>	<b>BOTA- 01705</b>	<b>Credit Hours</b>	<b>3(2+1)</b>
<b>Lecture</b>	.....day: .... period (00:00a.m to 00: 00a.m), Room# 00		
<b>Course Objective:</b> To provide students with brief introduction to fundamental concepts of Recombinant DNA Technology. To elucidate the basic principles of Biotechnology. To introduce the basic tools used in Biotechnology and Genetic Engineering.			
<b>Course Outcomes:</b>			
<b>Methods of Teaching</b> <ul style="list-style-type: none"><li>Assigned readings ✓</li><li>Group activities &amp; Discussion ✓</li><li>Audiovisual aids lectures ✓</li><li>Web-assisted instruction ✓</li><li>Student-Directed Teaching ✓</li></ul>			
<b>Resource Material</b>	<b>Books Prescribed:</b> 1. Martin R. Adams and Maurice O. Moss 2008. Food Microbiology 3 <sup>rd</sup> Ed. Published by The Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, UK 2. Frazier, W.C., Westhoff, D. C. 2008. Food microbiology. McGraw Hill Book Co., New York, USA. 3. David L. Nelson and Michael M. Cox 2004. Lehninger’s Principles of Biochemistry (4 <sup>th</sup> Edition). 4. John E. Smith 2009. Biotechnology (5 <sup>th</sup> edition) Cambridge University Press The Edinburgh Building, Cambridge CB2 8RU, UK.		
	2.Reference Book		3.Research Papers
	i	Lehninger’s Principles of Biochemistry (4 <sup>th</sup> Edition).	i
	ii	John E. Smith 2009. Biotechnology (5 <sup>th</sup> edition)	ii
	4.Hot Research Papers		5.Web Resources
	i		I
	ii		Ii
<b>Office Help Hours</b>	.....day: .... period (00:00a.m to 00: 00a.m), Room# 00		
<b>Grading</b>	Exam (Date to be announced) Mid- Exam (30%) Final Exam (50%) Problem Session/Assignments (20%)		
<b>Problem Session</b>	.....day: .... period (00:00a.m to 00: 00a.m), Room# 00		
<b>SEQUENCE OF TOPICS TO BE COVERED</b>			
Session	Topics (outline of main topics and sub topics)	Chapter #	Tutorial /Laboratory
1	Introduction to Biotechnology: Overview, Time line and the Public debate		Introduction to scientific equipment used in molecular biology.
2 & 3	The nature of Biotechnology, Important terminology and Basic concepts of Recombinant DNA Technology	<b>DNA Cloning: The Basics of Recombinant DNA Technology</b>	
4 & 5	Restriction Endonucleases and DNA Ligase Yield Recombinant DNA		
5 & 6	Cloning Vectors Allow Amplification of Inserted DNA Segments		
7& 8	Specific DNA Sequences Are Detectable by Hybridization, Identifying and isolating the individual genes.	<b>-do-</b>	Use of scientific equipment, electronic balance, microscope, flame photometer, electrophoresis cells, micro-centrifuge, Micro-pipits and calorimeter.
9 & 10	Expression of Cloned Genes Produces Large Quantities of Protein		
11 & 12	Alterations in Cloned Genes Produce Modified Proteins		
13 & 14	DNA Libraries Provide Specialized Catalogs of Genetic Information	<b>From Genes to Genomes</b>	
15, 16	The Polymerase Chain Reaction Amplifies Specific DNA Sequences		
	Genome Sequences Provide the Ultimate Genetic Libraries		
<b>Mid Term Exams</b>			

17	Sequence or Structural Relationships Provide Information on Protein Function	From Genomes to Proteomes	Preparation of solutions and buffers used in molecular biology.
18	Cellular Expression Patterns Can Reveal the Cellular Function of a Gene		
19	Detection of Protein-Protein Interactions Helps to Define Cellular and Molecular Function		
20	A Bacterial Plant Parasite Aids Cloning in Plants	Genome Alterations and New Products of Biotechnology	. Isolation of DNA from Onion leaves and roots: Gathering material used in the isolation of DNA and optimization laboratory conditions
21	Manipulation of Animal Cell Genomes Provides Information on Chromosome Structure and Gene Expression		
22	New Technologies Promise to Expedite the Discovery of New Pharmaceuticals		
23 & 24	The Human Genome and Human Gene Therapy, A Potent Weapon in Forensic Medicine.	-do-	
25	Recombinant DNA Technology Yields New Products and Challenges		
26	Analyzing genetic variations, DNA technology in forensics		Precipitation of DNA from Onion roots and leaves.
27&28	Mapping genes, cloning genes of unknown functions, Protein Chips, DNA Microarrays		
29	Bacterial Artificial Chromosomes (BACs), Yeast Artificial Chromosomes (YACs), Blotting techniques		Observation of DNA under microscope by staining with methylene blue.
30	Genetic engineering and industry		
31	Biotechnology and the developing world		
32	Course/Discussion from session 1- 31		
	Final Term Exam		

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:

Chairman