

**Course Title:** Functional Biology II

**Course Code:** FST-1104

**Resource Person:**

**Department:** Food Science and Technology

## **School of Food and Agricultural Sciences (SFAS) Vision**

SFAS endeavors to be a premier center of excellence, offering innovative, high-quality education and professional programs aimed at achieving academic and research excellence, enriching the lives of individuals and making a difference in the world of academia and industry, and to develop a society of professionals, who can contribute towards the betterment of their respective communities.

## **SFAS Mission**

SFAS Mission SFAS provides an intellectually rich, collaborative, research-focused and dedicated learning environment for students, faculty, and staff, while serving the community at various levels. SFAS at UMT has been established with the aim to integrate recent advances in food sciences/technology and agricultural innovations.

## **Program Learning Objectives (PLO's)**

Students graduating with BS Food Science and Technology shall be able to:

1. *Explain the basic principles of food sciences, and its multidisciplinary scope.*
2. *Explain the physical, chemical and biological properties of food and their effects on food safety, and sensory and nutritional quality.*
3. *Apply analytical techniques to characterize composition, and to identify physical, chemical and biological changes in foods.*
4. *Explain the effects of food processing, engineering, preservation, packaging, and storage on food safety and quality.*
5. *Identify the importance of food laws and regulations in ensuring safety and quality of the processed/manufactured foods.*
6. *Conduct applied research and use statistical tools in experimental design and data analysis.*
7. *Apply acquired knowledge to real world situations in food systems, components, production, and processes.*
8. *Apply critical thinking to professional problems.*
9. *Communicate effectively in both oral and written forms.*
10. *Develop organizational, teamwork, and leadership skills.*
11. *Demonstrate professional skills and thoughts of ethical, social integrity, and respect for diversity.*
12. *Demonstrate preparedness for continued reflective practice, and lifelong learning relevant to careers in food sciences.*

## Course Objectives (CLO's)

After the completion of this course, a student will be able to:

1. Familiar with the knowledge and understanding of the genetics and heredity characteristics.
2. Demonstrate the structure and function of the DNA.
3. Learn detailed information on diversity and evolution of the life on earth.
4. Find out the importance and role of the ecology and the biosphere.
5. Understand the biodiversity on earth and linkage between the ecosystems and the communities.

## Learning Objectives

Sr#	Course Learning Objectives	Link with Program Learning Objectives
1.	Familiar with the knowledge and understanding of the genetics and heredity characteristics.	Students will easily understand the importance of the genetics and heredity characteristics in the human life.
2.	Demonstrate the structure and function of the DNA.	Students are expected to know about the structure and function of the DNA and protein synthesis.
3.	Learn detailed information on diversity and evolution of the life on earth.	Students must be able to explain the diversity and evolution of the different life forms on earth.
4.	Find out the importance and role of the ecology and the biosphere.	Students will be able to explain the importance and role of the ecology and the biosphere and climate change impact on the earth.
5.	Understand the biodiversity on earth and linkage between the ecosystems and the communities.	Students will be able to understand the link between the ecosystems and the communities, and conservation and restoration of the ecosystems.

## Course Learning Outcomes

After successful completion of the course work, students have the skills to:

1. *Comprehend the genetics and importance of heredity.*
2. *Understand the structure and function of the DNA.*
3. *Explain the diversity and evolution of the life on earth.*
4. *Describe the importance and role of the ecology and the biosphere.*
5. *Compare the biological diversity and role of different ecosystems on the earth.*

## Teaching Methodology

### Interactive classes:

1. *Use media to increase student engagement and improve learning outcomes.*
2. *Try adding metaphors to help students remember details.*
3. *Give students a real-world context with extra projects to reinforce skills.*
4. *Provide practical practice within your lessons. Making it relatable will do wonders.*

### Case-based teaching:

### Class Participation

Positive, healthy and constructive class participation will be monitored for each class. Particular emphasis will be given to participants during the presentation sessions. How the question is asked or answered will also be noted. Your behaviour, as business executives in the class will contribute to the class participation marks.

### Word of Advice

Assignments/ projects are very demanding and time-consuming. Since you might be exposed to the real corporate environment, the ensuing reality checks could be demoralizing and frustrating. So, you must learn to handle intragroup conflicts and any clash of interests. Unless you start working on the assignments/ projects right away from the very first day you are likely to miss the deadlines.

### Participant Responsibilities:

Students should be responsible enough to practice whatever they have learned during class sessions. They should also implement it to other subjects as well. They are expected to come prepared in the class.

## **Class activities:**

### **Presentations**

After careful analysis, resource person will constitute the groups to achieve balanced heterogeneity among groups, for group assignments/projects and will have the final decision in this regard. Every member of the group is expected to be able to handle all aspects of the assignments. Groups are not allowed to choose presenters for various parts of the presentations; instead, resource person will nominate them. Individuals will be judged for their understanding of the topic through question handling. Q/A section of the presentations will weigh heavily for grading of assignments/ projects.

### **Class Discussions:**

During class, each student will work in a team on discussion questions. Teams will be assigned questions, allowed ten minutes for Internet research, and permitted five minutes to present their results. Points are earned by active participation with your team.

### **Applied Projects:**

This is a practical-based course. Regular attendance is the best predictor of success. Students will perform different practices with detailed instructions, teacher demonstrations, and video tutorials.

**STUDENTS ARE REQUIRED TO READ AND UNDERSTAND ALL ITEMS OUTLINED IN THE PARTICIPANT HANDBOOK**

### **Class Policy:**

Be on Time

You need to be at class at the assigned time. After minutes past the assigned time, you will be marked absent.

### **Mobile phone Policy**

**TURN OFF YOUR MOBILE PHONE!** It is unprofessional to be texting or otherwise.

### **Email Policy**

**READ YOUR EMAILS!** You are responsible if you miss a deadline because you did not read your email. Participants should regularly check their university email accounts regularly and respond accordingly.

## **Class Attendance Policy**

A minimum of 80% attendance is required for a participant to be eligible to sit in the final examination. Being sick and going to weddings are absences and will not be counted as present. You have the opportunity to use 6 absences out of 30 classes. Participants with less than 80% of attendance in a course will be given a grade 'F' (Fail) and will not be allowed to take end-term exams. International students who will be leaving for visas during semester should not use any days off except for visa trips. Otherwise, they could reach short attendance.

## **Class Attendance Policy**

A minimum of 80% attendance is required for a participant to be eligible to sit in the final examination. Being sick and going to weddings are absences and will not be counted as present. You have the opportunity to use 6 absences out of 30 classes. Participants with less than 80% of attendance in a course will be given a grade 'F' (Fail) and will not be allowed to take end-term exams. International students who will be leaving for visas during semester should not use any days off except for visa trips. Otherwise, they could reach short attendance.

## **Withdraw Policy**

Students may withdraw from a course till the end of the 12th week of the semester. Consequently, grade W will be awarded to the student which shall have no impact on the calculation of the GPA of the student. A student withdrawing after the 12th week shall be automatically awarded an "F" grade which shall count in the GPA.

## **Moodle**

UMT –LMS (Moodle) is an Open-Source Course Management System (CMS), also known as a Learning Management System (LMS). Participants should regularly visit the course website on MOODLE Course Management system and fully benefit from its capabilities. If you are facing any problem using Moodle, visit <http://oit.umt.edu.pk/moodle>. For further query send your queries to [moodle@umt.edu.pk](mailto:moodle@umt.edu.pk).

## **Harassment Policy**

Sexual or any other harassment is prohibited and is constituted as punishable offense. Sexual or any other harassment of any participant will not be tolerated. All actions categorized as sexual or any other harassment when done physically or verbally would also be considered as sexual harassment when done using electronic media such as computers, mobiles, internet, emails etc.

## Use of Unfair Means/Honesty Policy

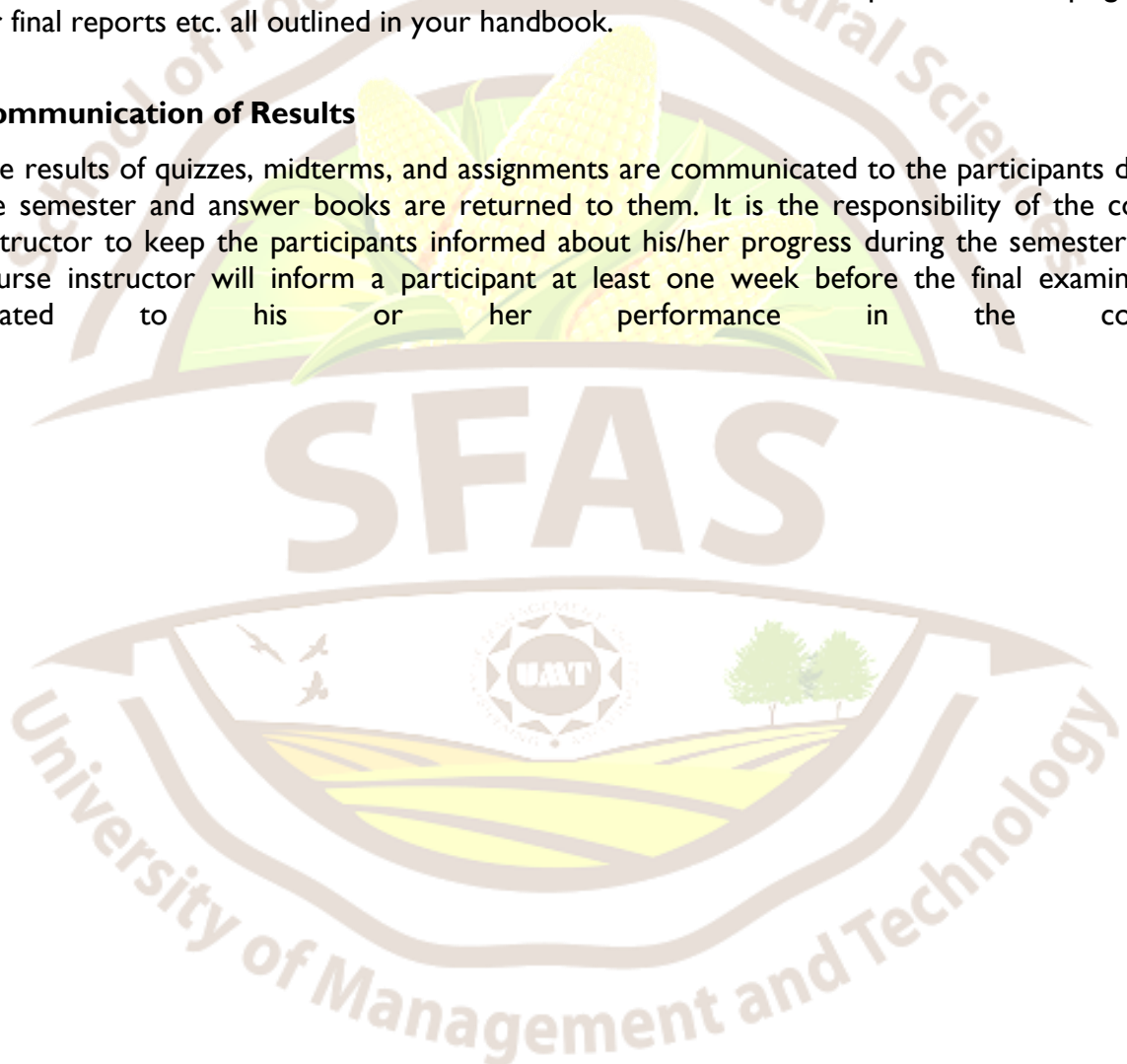
Any participant found using unfair means or assisting another participant during a class test/quiz, assignments or examination would be liable to disciplinary action.

## Plagiarism Policy

All students are required to attach a “Turn in” report on every assignment, big or small. Any student who attempts to bypass “Turn in” will receive an “F” grade which will count towards the CGPA. The participants submit the plagiarism report to the resource person with every assignment, report, project, thesis, etc. If a student attempts to cheat “Turn in”, he/she will receive a second “F” that will count towards the CGPA. There are special rules on plagiarism for final reports etc. all outlined in your handbook.

## Communication of Results

The results of quizzes, midterms, and assignments are communicated to the participants during the semester and answer books are returned to them. It is the responsibility of the course instructor to keep the participants informed about his/her progress during the semester. The course instructor will inform a participant at least one week before the final examination related to his or her performance in the course.



## Course Outline

**Course code:** FT-I104

**Course title:** Functional Biology II

<b>Program</b>	BS Food Science and Technology
<b>Credit Hours</b>	3 (2-1)
<b>Duration</b>	16 Weeks
<b>Prerequisites (If any)</b>	Functional Biology II
<b>Resource Person Name and Email</b>	
<b>Counseling Timing &amp; Room #</b>	3 hours per week (STD 502)
<b>Contact no.</b>	-
<b>Web Links</b>	-

**Director Programme Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

**Dean's signature** \_\_\_\_\_

**Date** \_\_\_\_\_

## Grade Evaluation Criteria

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

Marks Evaluation	Marks in percentage
Class Presentation	5%
Quizzes	10%
Assignments	10%
Class Project/Participation	5%
Lab	20%
Mid-Term	20%
Final exam	30%
Total	100%

## Recommended Text Books:

1. Simon, E. J., Dickey, J. L., Hogan, K. A. and Reece, J. B. 2019. Campbell Essential Biology. Pearson, USA.
2. Begon, M., Howarth, R. W. and Townsend C. R. 2014. Essential Ecology. Wiley.
3. Taylor, M. R., Simon, E. J., Dickey, J. L., Hogan, K. A., and Reece, J. B. 2017. Campbell Biology Concepts and Connections. Pearson, USA.



## Course: Functional Biology II

Course code: FST-II104

No	Topics to be covered in the course	Learning Objective of this topic	Expected Outcomes from Students	Teaching Method	Assessment Criteria	Deadlines and Homework
1	Introduction to Genetics and Heredity	To define the genetics and heredity To explain the need and importance of genetics and heredity characteristics To familiar with the important genetics and heredity characteristics	Improve understanding of the genetics and heredity characteristics	Lecture slides Short assignment	Class Participation	Within a Week
2	Variations in the genetics	To classify the variations in the genetics To explain the interaction of genes and chromosomal basis of inheritance	Improve understanding of variations in the genetics and the interaction of genes	Lecture slides Case study	Class Participation	Within a Week
3	Structure and Function of DNA	To learn the structure and function of DNA To demonstrate different genetics information transferred through DNA	Improve the understanding of structure and function of the DNA	Lecture Video tutorial Lab practical	Class participation Lab performance	Within a Week
4	How genes are controlled and regulated	Describe how genes are controlled and regulated Learn the genetic potential of the cells	Improve the understanding of the genes potential of the cells and how genes are controlled and regulated	Lecture Literature review	Quiz Class participation	Within a Week
5	Overview of the DNA technology	To describe the different DNA technologies To understand the genetic	Students understanding will be improved by	Lecture Literature review Video tutorial	Whiteboard test Quiz Case study	Within a Week

		engineering and gene sequencing	understanding the gene technologies and gene sequencing			
6	The diversity of life and evolution of populations	To describe the importance of diversity of life and evolution of populations To understand the evidence and mechanism of the evolution	Improve the understanding regarding the process involved in the diversity of life and evolution of population	Lecture Video tutorial Practical	Lab performance Case study Class participation	Within a Week
7	Guest Lecture I	TBD				Within a Week
8	<b>Revision &amp; Mid Exams</b>					
9	Evolution of the biological diversity	To familiar with the process of evolution of biological diversity To understand the classification of the biological diversity	Improve the understanding regarding the evolution and classification of the biological diversity	Lecture Class discussions Video tutorial	Class projects Quiz Lab Performance	Within a Week
10	Evolution of the microbial life	To identify the evolution of different microbial organisms To understand the processes involved in the evolution of prokaryotes and protists	Improve the understanding regarding the evolution of the microbial life	Lecture Quiz Surprise test Video tutorial	Whiteboard test Class projects Quiz	Within a Week
11	Evolution of plants and animals	To familiar with the process of evolution of plants and fungi on earth To understand the process of evolution of the animals line of the bottled water	Improve the understanding regarding the process of evolution of plants and animals	Lecture Assignment Lab practical	Whiteboard test Class projects Lab Performance	Within a Week

		manufacturing				
12	Introduction to ecology and the biosphere	To understand about the ecology and the biosphere and the phenomena of the climate change	To improve the understanding regarding the ecology and biosphere events	Lecture Slides Class discussions Class project	Whiteboard test Class projects Lab Performance	Within a Week
13	Guest Lecture II	<b>To be Decided</b>				Within a Week
14	Population ecology	To describe the factors specifically biotic and abiotic involved in the variation of the population ecology Understand the restoration and conservation of the population	To improve the understanding regarding different factors involved in the variation of the population ecology	Lecture Lab practical Video tutorial	Whiteboard test Quiz Lab performance	Within a Week
15	Biodiversity: communities and ecosystems	To understand the interactions between the communities of the ecosystems	To enhance the understanding of the interactions between the communities and the populations.	<ul style="list-style-type: none"> <li>· Class participation</li> <li>· Class projects</li> <li>· Q/A session</li> </ul>	Class presentation Viva	Within a Week
16	Final Examination	Application of all the concepts learned		On campus examination	Paper	Within a Week
<b>Result Display</b>						

## Lab Component

During the course students will be able to perform the following practical in the laboratory:

1. Understanding the scientific method and scientific study
2. Understanding scientific notation and the Metric System
3. Understanding and performing photosynthesis
4. Understanding and performing cellular respiration
5. *Understanding plant cell structure*
6. *Gram staining process*
7. *Planting project*





# University of Management and Technology

