Department of Food Sciences
University of the Punjab, Lahore
Course Outline

Programme	B.Sc. (Hons.) Food Science & Technology	Course Code	FST-307	Credit Hours	3(3-0)
Course Title	FUNDAMENTALS OF FOOD SYSTEMS				

Course Objectives

To familiarize the students with basics of food systems**.**

Learning Outcomes

On the completion of the course, the students will:

1. Define and explain the dimensions and determinants of food security.
2. Gain insights into historical overview, components and significance of sustainable food systems.
3. Evaluate impact of climate change, gender and youth mainstreaming on food, nutrition, and health
4. Understand Pakistan Food System Dashboard (PFSD) and its utilization for data acquisition

	Course Content	Assignments/Readings
Week 1	**Unit-I** 1.1 Introduction to Food Security 1.2 Dimensions and determinants of food security	
	1.3 National and global food security trends	
	1.4 Nutritional outcomes of food security	
Week 2	**Unit-II** 2.1 Food security and human rights	
	2.2 Youth and gender mainstreaming	
	2.3 Regional challenges and disparities.	
Week 3	**Unit-III** 3.1 Food systems: Overview 3.2 Components of food systems	
	3.3 Stakeholders of the food system	
Week 4	**Unit-IV** 4.1 Historical perspectives of food system	
	4.2 Pathways of food systems transformation	

	4.3 Drivers of food systems	
Week 5	**Unit-V** 5.1 Basics of socioeconomic	
	5.2 Technological	
	5.3 Innovation and policy drivers	
Week 6	**Unit-VI** 6.1 Sustainable food systems	
	6.2 Significance of sustainable food systems	
	6.3 Components of sustainable food systems	
Week 7	**Unit-VII** 7.1 Environment, innovation, technologies, policies etc.	
	7.2 Conventional and sustainable food production practices	
	7.3 Foods of plants and animal origin	
Week 8	**Unit-VIII** 8.1 Food value chain	
	8.2 Production, processing and distribution chain	
	8.3 Food losses and waste.	
Week 9	**Unit-IX** 9.1 Food consumption 9.2 National and global dietary trends	
	9.3 Nutrition and health trends 9.4 Food consumption behaviors	
	9.5 Economic aspects of food consumption	
Week 10	**Unit-X** 10.1 Challenges and issues in food systems	
	10.2 Ethics, equity and food access challenge	
	10.3 Climate change issues	
Week 11	**Unit-XI** 11.1 Climate change	

	11.2 Basics of climate change	
	11.3 Impact of climate change on food, nutrition and health	
Week 12	**Unit-XII** 12.1Adaptation and mitigation strategies for climate change	
	12.2 Introduction to Food system dashboards	
	12.3 Importance of food system dashboard	
Week 13	**Unit-XIII** 13.1Components of food system dashboard	
	13.2Databases	
	13.3 Global food system dashboard	
Week 14	**Unit-XIV** 14.1National food system dashboard	
	14.2Type of data	
	14.3 Data sources	
Week 15	**Unit-XV** 15.1Data sources and indicators	
	15.2 User interface elements	
	15.3 Menus, filters	
Week 16	**Unit-XVI** 16.1Introduction to data visualization tools	
	16.2 Hands-on practice	
	16.3Data visualization software.	

Textbooks and Reading Material

1. Food Security and Nutrition". Academic Press, Galanakis, C. M. (Ed.). (2020).
2. Sustainable Food systems. Building a new paradigm, Earthscan from Routledge. Marsden, T., & Morley, A. (2014).
3. Future Food Systems - Exploring Global Production, Processing, Distribution and Consumption (1st edition), Yada, R.Y., Acker, R.V., Scanlon, M., Gray, D. 2024. Academic Press.

4. “The State of Food Security and Nutrition in the World 2023”: Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum (Vol. 2023). Food & Agriculture Org.

5. Pakistan Food System Dashboard. Available at: https://www.foodsystemsdashboard.org/countries/pak; https://www.foodsystemsdashboard.org/

6. “Pakistan Food Systems Transformation Pathway, National Pathways for Food Systems Transformation in Pakistan” (A Strategic National Pathway Document), Ministry of National Food Security and Research (MNFSR)

7. https://summitdialogues.org/wp-content/uploads/2021/09/National-Pathways-for-Food-Systems-Transformation-in-Pakistan-Sep-15-2021.pdf

8. "Food Systems in an Unequal World: Pesticides, Vegetables, and Agrarian Capitalism in Costa Rica" by Ryan E. Galt

9. "Food Systems for Sustainable Development: Responding to the Environmental and Resource Challenges" by Ruerd Ruben, Jeroen Candel, and Albert P. J. Mol

10. "The Global Food System: Issues and Solutions" edited by William D. Schanbacher

11. "Data Visualization: A Handbook for Data Driven Design" by Andy Kirk

12. "Achieving Food Security in Asia: Pragmatic Policies and Strategies" edited by Jelle Bruinsma (2017)

13. "Sustainable Food Systems in Southeast Asia" by Gerhard van den Top and Wolfram H. Dressler (2021)

14. "Transforming Food Systems for a Rising India" by Prabhu Pingali, Anaka Aiyar, Mathew Abraham, and Andaleeb Rahman (2019)

15. "The Global Food System: Issues and Solutions" edited by William D. Schanbacher (2020)

16. "Food Security and Nutrition in Pakistan: Strategic Review" by World Food Programme and Sustainable Development Policy Institute (SDPI) (2017)

17. "Agriculture and the Rural Economy in Pakistan: Issues, Outlooks, and Policy Priorities" edited by David J. Spielman, Sohail J. Malik, Paul Dorosh, and Nuzhat Ahmad (2016)

Teaching Learning Strategies

1. Lectures
2. Discussions
3. Presentations
4. Quiz
5. Assignments

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessment

Sr. No.	Elements	Weightage	Details

1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.