

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



Program	B.Sc. (Hons.) Food Science & Technology	Course Code	FST-310	Credit Hours	3(2-1)
Course Title	Sugar and Confectionary Technology				
Course Introduction					
<p>This course will provide:</p> <ol style="list-style-type: none"> 1. Basic knowledge of sugar and confectionary industry. 2. Basic concepts concerning clarification/purification/refining of sugar for premium quality. 3. Laboratory skills for analysis of sugarcane/sugar beet juice and final produced sugar. 					
Learning Outcomes					
<p>After completing this course students should be able to:</p> <ol style="list-style-type: none"> 1. Elaborate processing and basic concepts related to raw sugar manufacturing. 2. Elaborate sugar processing and refining steps at sugar industry. 3. Discuss quality criteria for raw and refined sugar. 					
THEORY					
Course Content				Assignments/Readings	
Week 1	Unit-I			http://www.sucden.com/statistics/1_world-sugar-production	
	1.1 Sugar:				
	1.1.1 Introduction, Production, composition				
	1.1.2. Sugar industry in Pakistan				
Week 2	Unit-II			Assignment topic: Make a list of all the sugar industries in Pakistan along with their location.	
	2.1 Raw sugar manufacturing and refining:				
	2.2. Unit operations: -				
	2.2.1. Juice extraction				
	2.2.2. Purification				
	2.2.3. Heating				
	2.2.4. Evaporation and Crystallization.				
	2.2.4 Affination and Clarification				
Week 3	Unit- III				
	3.1. Decolorization, Crystallization and Centrifugation.				
	3.4. Drying, Storage and Bagging.				

Week 4	Unit-IV 4.1. Factors affecting sugar processing 4.2. Biological Factors	
	4.3. Chemical Factors 4.4. Environmental Factors	Assignment topic: Production and uses of Honey
Week 5	Unit-V 5.1. Sugar industry byproducts and their uses. 5.2. By-Products from sugar industry.	
	5.3. Uses of By-products from sugar industry	
Week 6	Unit-VI 6.1. Quality criteria for raw and refined sugar. 6.2. Quality criteria for sugarcane	
	6.3. Quality criteria for refined sugar	
Week 7	Quiz Test	
	Unit-VII 7.1. Confectionery: 7.2. Significance	
Week 8	Unit-VIII 8.1. Classification	Enlist major confectionery industries in Pakistan along with their location
	8.2. Industries in Pakistan	
Week 9	Unit-IX 9.1. Sugar confectionery: 9.2. Ingredients 9.3. Manufacturing 9.3.1. High boiled sweets	
	9.3.2. Caramel 9.3.3. Toffee Fudge	
Week 10	Unit-X 10.1. Gums 10.2. Sugar Free Confectionary	
	10.3. Chewing gum and chocolate technology. 10.4. Chewing gum technology	

Week 11	Unit-XI 11.1. Chocolate technology	Assignment topic: What are the issues associated with sugar and confectionery industry in Pakistan and how can they be minimized?
	11.2. Snack foods 11.2.1. History 11.2.2. Status	
Week 12	Unit-XII 12.1. Manufacturing Snack foods 12.2. Potatoes 12.3. Nuts	
	12.4. Cereals 12.5. Meat 12.6. Fish based	
Week 13	Unit-XIII 13.1. Puffed and baked snacks. 13.2. Introduction 13.3. Puffing process	
	13.4. Baking process	
Week 14	Unit- XIV 14.1. Seasonings: 14.2. Ingredients	Topics for presentations are given.
	14.3. Formulations 14.4. Applications.	
Week 15	Unit- XV 15.1. Quality control & Packaging 15.2. Introduction	
	15.3. Quality Control 15.4. Packaging materials 15.5. Packaging procedure	
Week 16	Quiz	
	Course Review	

PRACTICAL		
Course Content		Assignments/Readings
Week 1	Analysis of sugar and sugar processing by products: an introduction	
Week 2	Determination of pH (sugar cane juice, beet juice)	Awan, J.A.& Rehman, S.U. (2003). Food Analysis Manual. Unitech Communications, Faisalabad, Pakistan.
Week 3	Determination of total acidity	
Week 4	Determination of moisture content (sugar cane and beet samples)	
Week 5	Determination of moisture content (bagasse and vinasse)	
Week 6	Determination of total solids	
Week 7	Determination of soluble solids (sugar cane and beet juice)	
Week 8	Preparation of different sugar solutions	
Week 9	Determination of crude fiber	
Week 10	Determination of ash content (sugarcane)	
Week 11	Preparation of Sugar based confectionery: Candy	
Week 12	Preparation of Sugar based confectionery: Toffee	
Week 13	Manufacture of potato chips	
Week 14	Manufacture of nuggets	
Week 15	Manufacture of fried legumes and nuts	
Week 16	Course review	
Textbooks and Reading Material		
<ol style="list-style-type: none"> 1. Asadi, M. (2007). Beet Sugar Handbook. John Wiley & Sons, Inc., New York, USA. 2. Chen, J.C.P. (2007). Meade-Chen Cane Sugar Handbook. John Wiley & Sons, Inc., New York, USA. 3. Chen, C.C. (2000). Handbook of Sugar Refining: A Manual for the Design and Refining Facilities. John Wiley & Sons, Inc., New York, USA. 4. Lionnet, G.R.E. (1999). Sugar Technology for Students. Lang Fred, Durban, South Africa. 		
Teaching Learning Strategies		

Teaching will be a combination of class lectures, class discussions, and group work. Short videos/films will be shown on occasion.

Assignments: Types and Number with Calendar

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.