IGP-KSU Practical Flour and Dough Testing

IGP Institute / Kansas State University

May 18-22, 2026

Course Agenda

May 18, Monday		
08:00	Depart hotel for KSU Waters Hall Annex (IGP shuttle)	
08:15 – 10:00	**Welcome and Introductions** International Grains Program (IGP) overview and offerings **Understanding U.S. Wheat Classes and Basic Grades** Define the six classes of U.S. wheat and uses	*Dogan*
09:00 – 10: 00	**Why we do what we do?** Overview of Flour and Dough Testing: A holistic approach from grain quality assessment to flour functionality, dough rheology, and final product evaluation.	*Dogan*
10:00 – 10:15	Break	
10:15 – 12:00	**Grain Analysis** Evaluation of physical, chemical, and safety attributes of cereal grains to determine their quality and processing suitability (hardness, test weight, moisture and protein content, kernel size, and thousand kernel weight, color, insect damage, physical defects, etc.) **Tempering & Experimental Milling** Conditioning as a mean to improve flour yield and quality by facilitating efficient separation during milling. Principles of milling, overview of milling performance and mill reports.	*Dogan*
12:00 – 01:00	Lunch (Shallenberger 204)	
01:00 – 03:00	**Experimental Milling – *hands-on activity*** Overview of different lab mils and milling wheat samples (hard and soft) - Brabender Quadrumat Junior - Brabender Quadrumat Senior - Buhler MLU - Chopin LabMill - Mill reports, Flour composition, slick test.	*Blodgett & Thiele*
03:00 – 03:15	Break	
03:15 – 5:00	**Experimental Milling – *hands-on activity*** (cont'd)	*Blodgett & Thiele*

May 19, Tuesday		
08:00	Depart hotel for KSU Waters Hall Annex (IGP shuttle)	
08:15 – 09:45	**Flour Analysis - Introduction to Flour Composition** Review the basic components of wheat flour: starch, gluten proteins, arabinoxylans. Moisture, ash, and protein: Scientific principles of the direct and indirect methods (NIR measurement). Definition and importance of moisture basis. pH & TTA: Difference between pH and TTA measurements. Flour color: Flour components that contribute to color and its importance.	*Dogan*
09:45 - 10:00	Break	
10:00 – 12:00	**Flour Analysis – *hands-on activity*** - NIR - pH and titratable acidity - Flour color - Testing the mill fractions obtained on Monday.	*Dogan & Dorsch*
12:00 – 01:00	Lunch (Shellenberger 204)	
01:00 – 02:15	**All About Gluten** Exploring gluten quantity and quality through both manual and instrumental methods.	*Dogan*
02:15 – 02:30	Break	

02:30 – 05:00	**All About Gluten – *hands-on activity*** - Hand gluten washing: Isolate gluten from several types of flour. - Glutomatic: Evaluate the mechanized version of gluten washing. - GlutoPeak: Measure the aggregation of gluten in wheat flour to evaluate its quality	*Dogan & Dorsch*
05:00	Adjourn and depart for hotel (IGP shuttle)	

May 20, Wednesday		
08:00	Depart hotel for KSU Waters Hall Annex (IGP shuttle)	
08:15 – 09:45	**All About Starch** Working principles of alpha-amylase and starch pasting measurements. Physical and chemical changes that occur during starch gelatinization, pasting, and retrogradation.	*Dogan*
09:45 - 10:00	Break	
10:00 – 12:00	**All About Starch – *hands-on activity*** - Damaged starch (SDmatic) - Falling number (FN) - Rapid Visco Analyzer (RVA) - Testing flour samples, interpreting the data and discussing applications.	*Dogan & Dorsch*
12:00 – 01:00	Lunch (Shellenberger 204)	
01:00 – 03:15	**Water Holding Capacity** Tests for assessing the water holding capacity of flour, a key indicator of its functional properties in dough development and baking performance. **Solvent Retention Capacity (SRC) – *hands-on activity*** - Impact of flour components on water holding capacity. - Testing flour samples, interpreting the data and discussing applications.	*Dogan & Dorsch*
03:15 – 03:30	Break	
03:30 – 05:00	**Tour of IGP** Shawn Thiele, Associate Director of IGP **Tour of Kansas Wheat Innovation Center** Justin Gilpin, Chief Executive Officer Kansas Wheat Commission, Kansas Association of Wheat Growers	*Gilpin & Thiele*
05:00	Adjourn and depart for hotel (IGP shuttle)	

May 21, Thursday		
08:00	Depart hotel for KSU Waters Hall Annex (IGP shuttle)	
08:15 – 09:45	**Dough Development** Working principles of recording mixers: Farinograph, DoughLab and MixoLab in comparison.	*Dogan & Dorsch*
09:45 - 10:00	Break	
10:00 – 12:00	**Dough Development and Testing – *hands-on activity*** - Farinograph - DoughLab - MixoLab - Testing flour samples, interpreting the data and discussing applications.	*Dogan & Dorsch*
12:00 – 01:00	Lunch (Shellenberger 204)	
01:00 – 02:15	**Extensional Properties** Understanding the uni-axial and bi-axial extensional properties of flour dough. Working principles of Extensograph and Alveograph.	*Dogan*
02:15 – 02:30	Break	
02:30 – 05:00	**Alveograph – *hands-on activity*** Testing flour samples, interpreting the data and discussing applications.	*Dogan & Dorsch*

05:00	Adjourn and depart for hotel (IGP shuttle)	
06:30 – 08:30	**Dinner / Presenting Certificates** **Nico's Little Italy**	

May 22, Friday		
08:00	Depart hotel for KSU Waters Hall Annex (IGP shuttle)	
08:15 – 09:15	**Test Baking - Methods and Applications** Sponge dough and straight dough bread test baking methods. Sugar snap cookie and layer cakes.	*Karkle*
09:15 – 9:30	Break	
09:30 – 12:00	**Test Baking – *hands-on activity*** Sponge dough and straight dough bread test baking methods. Sugar snap cookie and layer cakes.	*Karkle & Dorsch*
12:00 – 01:00	Lunch (Shellenberger 204)	
01:00 – 02:15	**End-product Quality – *hands-on activity*** Product evaluation: Qualitative assessments, loaf volume, color, etc.	*Karkle & Dorsch*
02:15 – 02:30	Break	
02:30 – 4:30	**End product quality – *hands-on activity*** Structure and Texture: Crumb structure (C-cell) and texture analyzer.	*Karkle & Dorsch*
04:30 – 05:00	**Course Review and Wrap-Up**	*Dogan & Karkle*
	Adjourn and depart for hotel (IGP shuttle)	

Course Manager

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