Registration Information
- $1,200 Early-bird Registration Fee (U.S.) by June 14, 2019
- $1,300 Regular Registration Fee (U.S.)
Additional $200 fee for English–Portuguese simultaneous translation. Please contact Sajid Alavi salavi@ksu.edu for more details.

For course registration, please go to the IGP website (www.grains.ksu.edu/igp) and under “Upcoming Courses” click on the “IGP–KSU Extrusion Processing” link.

Hotel rooms and meals other than those mentioned in the Course Outline are not included in the registration fee.

Discounts and For-Credit Enrollment
If two or more people from the same organization enroll, each is entitled to a 10% discount. College students will receive a 20% discount on providing written endorsement of student status from a professor in their department. Students have the option of receiving two KSU Global Campus credits. Tuition and Global Campus charges will apply in that case, in addition to the course fee. For more details on registration for Global Campus credits, contact Dr. Sajid Alavi salavi@ksu.edu.

Questions or Special Needs
Please contact one of the following if you have a special dietary need or are physically limited:
IGP, igp@ksu.edu
Phone: 785-532-4070/Fax: 785-532-6080
or
Sajid Alavi, Course Instructor, salavi@ksu.edu
Dept. of Grain Science and Industry
Phone: 785-532-2403/Fax: 785-532-4017
www.grains.ksu.edu/extrusion

Comments from Past Participants
“Every aspect was informative and some sections gave in-depth knowledge on application/processing... I have several suggestions/recommendations to take back to my company.”
“This short course was really wonderful. Please tell me every time whenever these type of courses (are) held. I’ll be grateful to join them.”
“Awesome! Real world case studies (in the business planning session) are great. This separates this extrusion course from any other I have attended. Perfect!”
“I had fun and learned a lot (at the hands-on sessions). I was able to adjust fat, BPV (back pressure valve), and RPM (screw speed).”
“Good hands-on experience with the extruders.”
“An excellent course. I would love to recommend this to anyone... for an enrichment of fundamentals (of extrusion).”
“Very good high level overview (of ingredient functionality).”
“Good examples and practical problems (covered under troubleshooting).”

Who Should Attend
Technical and managerial personnel in the food, pet food, and feed industries and ingredient companies desiring training in fundamentals and operations; entrepreneurs who want to set up an extrusion-based business and would like to develop a business plan; and researchers interested in learning the latest trends in extrusion processing. The course is tailored for U.S. and international participants, and presents an excellent opportunity to develop contacts with experts and industry professionals from all over the world.

Hotel Information
Holiday Inn at the Campus
1641 Anderson Avenue, Manhattan, KS
Phone: 785-539-7531

Single/Double Room: $91.95 + tax
A block of rooms has been reserved at the Holiday Inn at the Campus at a special rate until June 14, 2019.
Reserve room directly with the hotel. It is important to mention group code EXT and the IGP Extrusion Course to obtain the special rate.

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Course Description
This course will cover topics including:
- principles of extrusion processing
- raw material selection
- equipment and control systems
- post-processing operations
- extruded products (including breakfast cereal, snacks, textured soy protein, pet food, and feed for poultry, animal and aquatic species)
- business planning and commercialization
- lab sessions and hands-on experience with pilot-scale extrusion equipment

This is the 11th straight year this course is being offered. More than 300 industry participants from 30 countries representing 6 continents have attended the KSU extrusion processing course. For more information and pictures from past courses please visit the course registration site and click on the link ‘Previous Course Information’. The course is jointly organized by the departments of grain science and agricultural economics at KSU, with active support by industry partners. The Kansas State Extrusion Lab has a strong emphasis on service, research and teaching and is primarily housed in the Bioprocessing and Industrial Value-Added Program building. It has a variety of facilities including lab-scale and pilot-scale twin and single screw extruders, and a pilot-scale gas-fired dryer.

Learn the Basics of Extrusion and Business Aspects
Extrusion processing of food and feed products is a multibillion dollar industry in the U.S. and Europe. This course will cover the state-of-the-art technology including different types of extruders, dryers and control systems. The processing of various food, pet food and feed products will be described. Participants will be exposed to sensory evaluation of foods, a critical step in the product development process, through a special hands-on lab session. The intricacies of setting up an extrusion-based business will be addressed including capital decision making and strategic planning. Case studies will be conducted with emphasis on both U.S. and developing world markets.

Speakers
Koushik Adhikari, Assistant Professor Food Science, University of Georgia
Sajid Alavi, Professor Grain Science and Industry, KSU
Vincent Amanor-Boadu, Associate Professor Agricultural Economics, KSU
Fadi Aramouni, Professor Food Science Institute, KSU
Michael Bachelor, Engineer Bachelor Controls, Inc., Sabetha, KS
Topher Dohl, Research Coordinator Wenger Manufacturing, Inc., Sabetha, KS
Keith Erdley, Drying Technical Service Wenger Manufacturing, Inc., Sabetha, KS
Douglas Hanify, Director of Technology Spray Dynamics, Ltd., St. Clair, MO
Eric Maichel, Extrusion Lab Manager Grain Science and Industry, KSU
Brian Plattner, Process Engineering Manager Wenger Manufacturing, Inc., Sabetha, KS
Brad Strahn, Principal The XIM Group, LLC, Sabetha, KS
Bhadirajju Subramanyam, Professor Grain Science and Industry, KSU

Note: A significant feature of the IGP–KSU Extrusion Course is a hands-on session on the science and practice of sensory evaluation and consumer acceptance studies for new products.

Course Outline
Day 1 – August 13 (Tuesday)
7:30 a.m. Registration
8:00 a.m.
- Ingredient Functionality
- Extrusion Hardware and Design
- Extrusion Operation and Process Variables
- Extrusion Applications – Food
12 Noon Group Luncheon
1:00 p.m.
- Drying and Toasting
- Hands-on Session on Pilot-Scale Extruders
6:00 p.m. Banquet
Day 2 – August 14 (Wednesday)
8:00 a.m.
- Extrusion Applications – Feed and Pet Food
- Coating of Snacks and Cereals
- Extrusion Control Systems
- Extrusion Troubleshooting
12 Noon Group Luncheon
1:00 p.m.
- Principles of Die Design
- Hands-on Session on Pilot-Scale Extruders
Day 3 – August 15 (Thursday)
8:00 a.m. Textured Soy Protein
10:00 a.m. Instrumental/Analytical Techniques
11:00 a.m. Field trip to Wenger Manufacturing Group Luncheon
Day 4 – August 16 (Friday)
8:00 a.m.
- Sensory Aspects of Extrusion Products
- Overview of the Product Development Process
- Plant Sanitation and Pest Management
12 Noon Group Luncheon
1:00 p.m.
- Business Plan: Capital Decision Making
- Business Plan: Strategic Planning
- Case Study and Active Interaction

Optional Supplement
Pet Food Workshop August 12, 2019
Register for an optional supplemental one-day Pet Food Workshop on August 8, 2016. This workshop can be attended as a stand-alone participation or together with the Extrusion Processing: Technology and Commercialization Course.

The Pet Food Workshop will consist of industry experts and academic speakers from the area of pet nutrition and processing, and will provide latest information on pet food ingredient trends, nutritional requirements for dogs and cats, specialty treats, sensory evaluation/palatability tests and safety/HACCP issues. It will also include a “capstone lab session” involving formulation exercises for pet food recipes.

Registration Information
(Only for Optional Supplement: Pet Food Workshop)
* $275 Early-bird Registration Fee (U.S.) by June 14, 2019
* $325 Regular Registration Fee (U.S.)

No registration discounts other than the “Early-bird” discount applicable for the Optional Supplement. To register for the Pet Food Workshop on August 14, visit the IGP website (www.grains.ksu.edu/igp) and under “Upcoming Courses” click on the “IGP–KSU Pet Food” link. For more details on this Supplemental Pet Food Workshop, please contact Dr. Sajid Alavi (salavi@ksu.edu).