



CONTINUING PROFESSIONAL DEVELOPMENT COURSES

Continuing Professional Development (CPDs) courses are brought to AIM by ASABE member professionals in their field as an added value to the overall program. Each course is available to add-on to your AIM registration prior to June 12. All qualify for professional development hour credits as well. Please note that these are on Sunday (except CPD5) and may be at the same time. AIM registration is required to register for CPDs.

CPD1 Future of Stored Grain Monitoring and Management

Sunday, July 12 8:00am - 1:00pm

Description:

This Continuing Professional Development (CPD) workshop, 'Future of Stored Grain Monitoring and Management,' will deliver participants with a forward-looking overview of new technologies designed with data-driven approaches, and integrated systems used to monitor and manage stored grain quality. The session is likely to bring together researchers and industry personnel's to explore recent advances in temperature and CO₂ sensing, model-based decision support systems used across modern grain storage facilities. Participants will gain practical insights into how sensor networks, data analytics, and predictive models are transforming stored grain management from early detection of spoilage and insect activity to improved aeration control and loss prevention. The workshop combines technical presentations with live demonstrations of monitoring hardware and software systems, allowing attendees to directly connect theory with real-world application.

Learning Outcomes:

- Understanding the principles and limitations of temperature- and CO₂-based grain monitoring systems
- Evaluating model-based and sensor-driven decision support tools for stored grain management
- Identifying best practices for integrating monitoring technologies into grain storage operations
- Gaining awareness of current commercial solutions and future research directions in stored grain monitoring

Target Audience:

This CPD session is intended for a diverse audience involved in grain production, handling, storage, and processing. Target participants include agricultural and biosystems undergraduate and graduate students, educators, researchers, engineers and extension specialists with an interest in post-harvest systems and digital agriculture.

Individuals affiliated with education, information technology, sensors and control systems, plant and facility systems, and processing systems will find the content especially relevant, as the workshop bridges engineering fundamentals, applied research, and real-world implementation. Prior expertise in stored grain systems is helpful but not required as the workshop is structured to be accessible while still offering depth for experienced professionals.

Session Format:

The session will be conducted as a half-day (8 am to 1 pm), in-person workshop including a mix of expert-led presentations, interactive discussions, and hands-on demonstrations. The workshop will begin with a systems-level overview of stored grain monitoring, followed by focused technical talks on temperature sensing, CO₂-based monitoring, and model-driven management approaches.

To actively engage participants, each technical segment will include time for questions and discussion, encouraging dialogue between diverse groups of attendees. The final portion of the workshop will feature live

demonstrations of commercial monitoring equipment and software platforms, allowing participants to directly interact with technologies currently used in grain storage operations.

Relevance:

Stored grain losses due to spoilage, insects, and poor management remain a major challenge globally. This CPD workshop directly addresses these challenges by showing participants the innovative monitoring technologies, data-driven management approaches, and real-world solutions shaping the future of stored grain systems. Educators and researchers will gain insights into emerging research needs and industry practices, while industry professionals and consultants will better understand how to evaluate, implement, and optimize monitoring technologies. For professionals, the session enhances technical competency in sensor-based monitoring, modeling, and decision support skills that are increasingly critical as grain systems adopt digital and automated approaches.

Sponsoring Committees:

Education, Outreach & Professional Development; Information Technology, Sensors & Control Systems; Plant, Animal, and Facility Systems; Processing Systems

Instructors:

Klein Ileleji, PhD, Purdue University; John Lawrence, PhD, PE, AGI Digital; Joey Varikooty, AmberAg; Sotiris Bantas, PhD, Centaur Ag

Cost: \$ 20 Minimum required: 15

CPD2 Develop Custom Autonomous UAVs from the Ground Up for Precision Agriculture

Sunday, July 12 8:00am - 4:00pm

Description:

With the rapid adoption of Unmanned Aerial Vehicles (UAVs) in agriculture, environmental monitoring, and field automation, professionals increasingly need deep, hands-on expertise in building and deploying autonomous UAV systems beyond off-the-shelf platforms. Commercial drones often limit access to low-level control, sensor fusion, and autonomy customization, restricting their use in advanced research and precision agriculture applications.

This CPD provides participants with end-to-end knowledge of designing, assembling, simulating, and deploying custom autonomous UAVs from scratch. Attendees will learn how to select UAV hardware, integrate sensors and flight controllers, develop autonomy using ROS2, and validate algorithms using Software-In-The-Loop (SITL) simulation before real-world deployment.

Learning Outcomes:

1. Identify and select key UAV components including airframes, motors, ESCs, sensors, and flight controllers.
2. Assemble and configure a custom UAV for autonomous operation.
3. Implement autonomous flight behaviors using ROS2-based architectures.
4. Use SITL simulation for safe testing, debugging, and validation of UAV autonomy.
5. Apply custom UAV autonomy to precision agriculture use cases such as crop monitoring, field mapping, and inspection.

Target Audience:

Agricultural engineers, researchers, robotics engineers, students, and professionals interested in UAV autonomy for agriculture.

Session Format:

Morning: UAV hardware, design, assembly, and configuration.

Afternoon: ROS2 autonomy, SITL simulation, mission planning, demonstrations, Q&A.

Relevance:

This CPD equips participants with foundational skills to build, test, and deploy custom UAV platforms for research and real-world agricultural applications.

Sponsoring Committees:

EOPD, ITSC, MS-54, MS-60

Instructors:

Veera Venkata Ram Murali Krishna Rao Muvva, University of Nebraska-Lincoln; Santosh Pitla, University of Nebraska-Lincoln

Cost: \$150 **Minimum required:** 8

CPD3 Application for LLMs (ChatGPT, Claude, Copilot) in Ag, Food & Biosystems Engineering

Sunday, July 12 9:00am - 12:00pm

Description:

This interactive 3-hour workshop explores the transformative potential of Large Language Models (LLMs) like ChatGPT in Ag, Food, and Biosystems Engineering. Participants will discover how LLMs can streamline research, enhance decision-making, and automate technical writing. Through real-world case studies and hands-on activities, attendees will learn to optimize LLMs for tasks such as predictive and forecasting analytics, sustainability reporting, and stakeholder communication. No prior experience with LLMs is necessary, making this session ideal for students, researchers, and professionals eager to integrate AI-driven tools into their workflows and drive innovation in the agri-food sector.

Learning Outcomes:

Participants will leave the workshop with (1) Practical skills to use LLMs effectively in their work. (2) Insights into potential applications and limitations. (3) Resources for integrating LLMs into their professional workflows.

Target Audience:

This CPD session targets professionals, researchers, students, and industry practitioners in Ag, Food, and Biosystems Engineering, focusing on integrating AI tools like LLMs into workflows. Ideal for those seeking practical skills in data analysis, technical writing, and decision-making, with no prior AI experience required. Enthusiasm for technology is a plus!

Session Format:

The session will feature interactive lectures, live demos, and hands-on activities, including prompt engineering, data analysis, and scenario-based challenges. Participants will explore real-world applications, collaborate on problem-solving, and engage in discussions to apply LLMs to their work, ensuring a dynamic, practical, and engaging learning experience.

Relevance:

This session is highly relevant to the professional development of the targeted audience as it introduces cutting-edge AI tools, enhancing their ability to analyze data, automate technical writing, and solve complex problems in Ag, Food, and Biosystems Engineering. The session fosters innovation, improves efficiency, and ensures they stay competitive in an increasingly technology-driven field by equipping participants with practical LLM skills. It also emphasizes ethical AI use, preparing professionals to navigate challenges responsibly while advancing their expertise and career prospects.

Sponsoring Committees:

All ASABE Technical committees and groups will find this session useful. This session is sponsored explicitly by YPC.

Instructor:

Sushant Mehan, South Dakota State University

Cost: \$25 **Minimum required:** 10

CPD4 Practical Tools for Designing Human-Centric Circular Bioeconomy Systems

Sunday, July 12 1:00pm - 3:30pm

Description:

Circular bioeconomy systems are often designed with a strong focus on technical efficiency, resource recovery, and material circularity. However, many promising innovations struggle during implementation when workforce systems, community impacts, and stakeholder dynamics are not fully considered during design. This interactive professional development session equips participants with practical tools to design circular bioeconomy systems that are both technically effective and socially resilient. Through guided exercises and applied design activities, participants will develop skills in identifying how mental models shape engineering decisions and in using community-based participatory design approaches to strengthen circular system outcomes. Participants will work individually and in small groups to apply these tools to real-world bioeconomy contexts and reflect on opportunities for application in their work.

Learning Outcomes:

1. Recognize how mental models influence engineering decisions, system boundaries, and definitions of success.
2. Apply structured mental model reflection tools to circular bioeconomy challenges.
3. Use community-based participatory and co-design approaches to improve system adoption and resilience.
4. Map stakeholders, benefits, and risks within circular bioeconomy systems.
5. Identify actionable strategies to integrate human-centric design into their professional practice.

Target Audience:

This session is designed for ASABE members working across the circular bioeconomy, including faculty, researchers, industry professionals, extension specialists, and graduate students. Marketing to CBSI members would be helpful. It will be particularly valuable for those engaged in biomass utilization, bio-based manufacturing, sustainable systems design, supply chain innovation, and community-facing engineering projects. The session focuses on practical tools that engineers and applied scientists can use immediately in technical, academic, and industry contexts. Individuals involved in interdisciplinary projects, stakeholder engagement, sustainability initiatives, and CBSI-related work will find the session especially relevant.

Session Format:

This highly interactive 2.5-hour session emphasizes skill development through hands-on activities and guided application. After a brief framing of key concepts, participants will engage in two core skill-building modules: (1) recognizing and working with mental models in engineering design, and (2) applying community-based participatory and co-design approaches to circular bioeconomy systems. Participants will take part in structured individual reflection, small-group discussions, stakeholder and systems mapping exercises, and a ladder of inference activity. Facilitators will use visual system maps, collaborative worksheets, and real-world examples to support learning and engagement.

The session emphasizes practical application, ensuring participants leave with tools and strategies that can be immediately used in professional practice.

Relevance:

As circular bioeconomy initiatives expand globally, engineers and applied scientists are increasingly called upon to design solutions that are not only technically efficient but also socially resilient and implementable in real-world contexts. Many projects encounter barriers when stakeholder dynamics, workforce impacts, and community considerations are not addressed during early design stages.

This session provides practical tools to help ASABE members anticipate these challenges and design more

effective circular systems. By strengthening skills in mental model awareness and participatory design, participants will be better prepared to lead interdisciplinary projects, improve stakeholder alignment, enhance system adoption, and support long-term sustainability of circular bioeconomy innovations. The session supports professional development in systems thinking, sustainable design, stakeholder engagement, and innovation leadership, and aligns with emerging priorities across the circular bioeconomy and broader engineering profession.

Sponsoring Committees:

CBSI, E-03, EOPD-412, ASE-16, ES-220

Instructors:

Jenny Keshwani, Utah State University; Marybeth Lima, Louisiana State University; Deepak Keshwani, Utah State University; Catelyn Bridges, University of Nebraska

Cost: \$15 **Minimum required:** 10

CPD5 ASABE Journals Reviewer Certification

Tuesday, July 14 5:15pm - 6:15pm

Learning Outcomes:

The learning outcomes will include knowledge of the journal article review process, additional skills in conducting a journal review, and additional knowledge in the ASABE journal system.

Target Audience:

Members interested in learning more about the journals and the review process and members interested in becoming a quality reviewer.

Session Format:

The session will include breakouts, presentations, and Q&A with the audience.

Relevance:

The professional development relevance and importance provided by this CPD is to continually educate those new to the journals or the journal review process to assist with the high-quality publication of our discipline programs.

Sponsoring Committees:

EOPD 210, YPC

Instructors:

Kasiviswanathan Muthukumarappan, South Dakota State University; Sudhagar Mani, University of Georgia; Patricia Smith, Texas A&M University

Cost: \$10 **Minimum required:** 10