

2017 Master Brewers Brewing Engineering and Utilities Course

University of Wisconsin | Madison, Wisconsin, U.S.A.

August 20 – September 1, 2017

Week One: Aug 20 – Aug 26 | Course Director: Darren Goodlin

Focus is on brewing and utility process systems, related sizing calculations, and common equipment.

Sunday, August 20: Check-in Day

All day Students pick up course information packets when checking in at the front desk.
7:00 p.m. **Reception Dinner and Orientation**—Lowell Center Dining Hall (Casual Attire)
Master Brewers Course Director

All Classes are held in Room DE235 of the Pyle Center.

Monday, August 21: Kickoff, Maintenance Fundamentals and Piping

8:00 a.m. – 8:30 a.m. **Course Introduction and Case Study Assignments**
Darren Goodlin, GPS

8:30 a.m. – 10:30 a.m. **Process Pumps**
Kevin Tyrrell and Randy Verges, Fristam Pumps

10:30 a.m. – 12:00 p.m. **Valves**
Jeff Tocio, Pentair

12:00 p.m. – 1:00 p.m. Lunch at Pyle Center

1:00 p.m. – 3:00 p.m. **Utility Plant Operations**
Bill Alison, Sierra Nevada

3:00 p.m. – 5:00 p.m. **Sanitary Design**
Oliver Meinhold, Loeffler Chemical

Tuesday, August 22: Engineering Calculations and Sizing Material Preparation

8:00 a.m. – 9:30 a.m. **Brewing Utilities**
Fred Scheer, Kronos, Inc.

9:30 a.m. – 12:00 p.m. **CIP System Utility and Engineering Design Considerations**
Oliver Meinhold, Loeffler Chemical

12:00 p.m. – 1:00 p.m. Lunch at Pyle Center

1:00 p.m. – 3:00 p.m. **Stainless Steel Equipment and Piping Passivation**
Oliver Meinhold, Loeffler Chemical

3:00 p.m. – 5:00 p.m. **Fluid Flow and Dynamics**
Dean Schlueter, Equipment Pro

Wednesday, August 23: Brewery Engineering and Design Consideration

8:00 a.m. – 10:00 a.m. **Brewhouse, Cellar, and Utility Design Consideration**
Graham Broadhurst, Sprinkman Brewing System

10:00 a.m. – 12:00 p.m. **Brewhouse Thermal Engineering Calculations**
Graham Broadhurst, Sprinkman Brewing System

12:00 p.m. – 1:00 p.m. Lunch at Pyle Center

- 1:00 p.m. – 3:00 p.m. **State of the Art Engineering: Flash Pasteurizing with Smart Energy Management in Modern Breweries**
Alois Monzel, KHS
- 3:00 p.m. – 5:00 p.m. **State of the Art Engineering: Thermal Power Station**
Alois Monzel, KHS

Thursday, August 24: Engineering Key Elements

- 8:00 a.m. – 11:00 a.m. **Plant Layout and Design**
Tobias Becher, Ziemann
- 11:00 a.m. – 12:00 p.m. **Process Equipment and Piping – Materials of Construction**
Tobias Becher, Ziemann
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 3:00 p.m. **Piping and Insulation**
Dan Stromberg
- 3:00 p.m. – 5:00 p.m. **Project Management**
Aaron Landolt, Day & Zimmerman

Friday, August 25: Plant Layout, Sanitary Design and Instrumentation

- 8:00 a.m. – 10:00 a.m. **Applied Engineering Economics to Capital Expenditure Projects in the Brewery**
Jaime Jurado, Abita Brewing Co.
- 10:00 a.m. – 12:00 p.m. **Reliability Management**
Rob Feters, AB retired
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 2:30 p.m. **Applications from the Engineering Math Toolkit for Brewery Applications in Brewing, Processing, and Packaging**
Jaime Jurado, Abita Brewing Co.
- 2:30 p.m. – 4:30 p.m. **Brewery Safety**
Mark Jaeggi
- 4:30 p.m. – 5:00 p.m. **Students turn in Case Study Assignments**

Saturday, August 26: Case Studies and Local Brewery Tour

- 8:00 a.m. – 12:00 p.m. **Case Study Presentations**
All students, Course Director
- 12:00 p.m. – 4:00 p.m. **Tour of Capital Brewery**
- 4:00 p.m. – 11:00 p.m. **Hospitality Suite open**

Sunday, August 27: Free Day! No Scheduled Activities

For students participating only in Week 1 of the course, you must check-out of hotel by 11:00 a.m.

- 3:00 p.m. – 11:00 p.m. **Hospitality Suite open**

Week Two: Aug 27 – Sept 1 | Course Director: Darren Goodlin

Dive into the details on the brewery utilities, including water and wastewater treatment, compressed air, steam boilers, CO₂ Systems, Electrical and other aspects of utilities. Considerations of brewery inline instrumentation, automated process controls and presentation of each team's case study.

Sunday, August 27: Free Day! No Scheduled Activities

For students participating only in Week 2 of the course, this is check-in day at the hotel.

All Classes are held in Room DE235 of the Pyle Center.

Monday, August 28: Incoming Water, Outgoing Wastewater, & Related Project

Considerations

- 8:00 a.m. – 8:15 a.m. **Case Study Assignments**
Darren Goodlin, GPS
- 8:15 a.m. – 10:00 a.m. **Incoming Brewery Water Treatment Systems**
Jack Bland & Rick Brundage, Chemtreat
- 10:00 a.m. – 12:00 p.m. **Water Treatment Associated w/Brewing, Boilers, & Pasteurizers**
Jack Bland & Rick Brundage, Chemtreat
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 3:00 p.m. **Waste Water Systems Overview**
Jeff Van Voorhis, Symbiont
- 3:00p.m. – 5:00 p.m. **Waste Water Projects, Operations, & Troubleshooting**
Jeff Van Voorhis, Symbiont

Tuesday, August 29: Compressed Air, Steam System Considerations

- 8:00 a.m. – 10:00 a.m. **Compressed Air Equipment Selection and Sizing**
Jeff Yarnall, Rogers Machinery
- 10:00 a.m. – 12:00 p.m. **Brewing Waste Byproducts Handling Considerations (Grain, Filter Aids, Hops, Yeast)**
Chris Atkinson, Gusmer Enterprises
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 3:00 p.m. **Steam System & Steam System Calculations**
Steve Huffman, Mead O'Brien
- 3:00 p.m. – 5:00 p.m. **Steam Systems, Parts, and Pieces**
Steve Huffman, Mead O'Brien

Wednesday, August 30: Refrigeration – Chiller and CO₂ Systems

- 8:00 a.m. – 10:00 a.m. **Chiller System Types, Selection, and Sizing**
Damon Reed, Pro Refrigeration
- 10:00 a.m. – 12:00 p.m. **Chiller System Operation and Maintenance Considerations**
Damon Reed, Pro Refrigeration
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 3:00 p.m. **CO₂ Collection**
Gabriel Dominguez, Union
- 3:00 p.m. – 5:00 p.m. **CO₂ Distribution Systems**
Gabriel Dominguez, Union

Thursday, August 31: Brewery Process Automation, Inline Instrumentation, and Digital Bus Technologies

- 8:00 a.m. – 10:00 a.m. **Brew Process Controllers (PID Demystified)**
Stephen Carter, LT Software Solutions
- 10:00 a.m. – 12:00 p.m. **Brew Automation Considerations & Control Loops**
Stephen Carter, LT Software Solutions
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center
- 1:00 p.m. – 2:30 p.m. **Brewery Automation, Instrumentation, and Communication Bus Type Considerations**
Stephen Carter, LT Software Solutions
- 2:30 p.m. – 3:30 p.m. **Inline Instrumentation Types, Selection, Considerations, Maintenance**
Darren Goodlin, GPS
- 3:30 p.m. – 5:00 p.m. **Brewery Information Technology Network & Security Considerations**
Dino Busalachi, Rockwell
- 7:00 p.m. **Reception Dinner**—Lowell Center Dining Hall (Casual Attire)
Closing Remarks and Awarding of Certificates

Friday, September 1: Wrap Up and Check-out

All students must check-out of hotel by 11:00 a.m.

- 8:00 a.m. – 12:00 p.m. **Students Present Results of Case Study**
All students, Course Director
- 11:00 a.m. **Finalize Hotel Check-out**
- 12:00 p.m. – 1:00 p.m. Lunch at Pyle Center (*Optional*)