SHORT COURSE ANNOUNCEMENT

Hands-On Essentials of Automation for Biomanufacturing

Hands-on course fee: $1,600

For course dates, visit go.ncsu.edu/btec_short_courses

A prerequisite online course offered through the International Academy of Automation Engineering (IAAE) must be completed before attending this course. Please register for the online course at www.myiaae.org. BTEC will request a copy of your certificate of completion prior to the start of the hands-on course.

Obtain knowledge and hands-on experience with industry-relevant process control equipment, hardware, control software, and documentation for control/automation of biomanufacturing operations. Engage in hands-on experiences with process sensors/equipment and their integration with a control system for enacting control strategies. Learn how to connect process equipment and I/O interfaces for use with a commercial software package.

For additional information, please contact BTEC Professional Development and Marketing Coordinator Erica Vilsaint at embrown4@ncsu.edu.

This course was developed with a project award from the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) and financial assistance from the U.S. Department of Commerce, National Institute of Standards and Technology (70NANB17H002).

Course schedule

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<th>Day 1</th>
<th>Day 2</th>
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<td>Course orientation</td>
<td>Lecture: Intro to DeltaV software II (connecting device/adding control module); description of temperature and pH control activities</td>
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<tr>
<td>Lecture: Recap typical automation project sequence and documentation; intro to bioreactor skid and distributed control system (DCS) structure</td>
<td>Lecture: CIP process and design concepts</td>
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<tr>
<td>Lab: Familiarization with 2 L bioreactor control skid, DCS equipment, and documentation</td>
<td>Lab: Temperature and pH control activities</td>
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<td>Lecture: Discussion of science behind various instrumentation</td>
<td>Lab: Operation of CIP skid (pilot scale)</td>
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<tr>
<td>Lab: Calibration of sensors</td>
<td>Lecture: Description of feeding control and DO control activities</td>
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<tr>
<td>Lab: Exploration of I/O card communication</td>
<td>Lecture: Overview of TFF concepts, equipment, and lab activity</td>
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<td>Lab: BTEC utilities tour</td>
<td>Labs: Feeding control and DO cascade control</td>
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<tr>
<td>Lecture: Intro to DeltaV software I (various applications/screens)</td>
<td>Lab: Operation of TFF skid (bench scale)</td>
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<td>Lab: Start-up of control system/loop check of equipment</td>
<td>Lecture/Lab: Overview of Factory Acceptance Test/Site Acceptance Test</td>
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<td>Course wrap-up</td>
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REGISTER NOW: go.ncsu.edu/btec_short_courses
About the instructor

Ryan Barton, Ph.D.

Dr. Ryan Barton is an automation/data scientist at BTEC. He has experience in fermentation processes using bacteria (batch and continuous), bioreactor design, and catalytic conversion of biomass. Additionally, he has experience with bioreactor process control and automation instrumentation/software.

Dr. Barton spent one year as a postdoctoral researcher at North Carolina State University where he worked on design and characterization of a prototype bioreactor for continuous bioprocessing of gas (methane) via aerobic bacterial fermentation. Dr. Barton earned his Bachelor of Science in chemical and biological engineering from the State University of New York at Buffalo, and his co-major doctorate in chemical and biomolecular engineering and forest biomaterials from North Carolina State University.

Important information for short course participants

Location
This course is held on site at BTEC. The Golden LEAF BTEC building is located at 850 Oval Drive on NC State University’s Centennial Campus.

Payment
BTEC accepts payment from all major credit cards including American Express, Visa, and MasterCard. If you wish to pay by company check, please email melody_woodyard@ncsu.edu for additional information immediately after registering.

Discounts available
A 20% discount is available to:

• Employees of NC Biotech Manufacturers Forum (BMF) member companies
• Groups of five or more from one company registering for the same offering of this course
• Individuals registering for more than one course at a time
• Faculty/staff working in academic environments

A 40% discount is available for NIIMBL members.

Pre-course communication
Registered course participants will receive an email three weeks before the scheduled course with detailed information regarding travel to BTEC, parking information, and a short pre-course questionnaire.

Cancellation policies

CANCELLATION BY REGISTRANT
To cancel a registration and be eligible for a refund of course fees, you must notify BTEC by email. Fees are refunded according to the following schedule:

• 100% refund – If notification is received at least 15 business days in advance of course start date
• 75% refund – If notification is received 10–14 business days in advance of course start date
• 50% refund – If notification is received 6–9 business days in advance of course start date
• No refund will be issued if notice is received 5 or fewer business days in advance of course start

Substitutions may be made up to two business days prior to the course start date.

CANCELLATION BY BTEC
BTEC retains the right to cancel a professional development short course no less than 10 business days in advance of the scheduled course start date. Registrants will be notified by BTEC if a course is cancelled and will receive a full refund of registration fees paid. BTEC is not responsible for airfare penalties or other costs incurred due to cancellation.