# 8/13/2020

# brcc keystone logo

Baton Rouge Community College

*Academic Affairs Master Syllabus*

Date Approved: 28 August 2020

Term and Year of Implementation: Fall 2020

**Course Title:** Process Instrumentation

**BRCC Course Rubric:** PTEC 1312

**Previous Course Rubric**:

**Lecture Hours per week-Lab Hours per week-Credit Hours**: 2-0-2

**Per semester: Lecture Hours-Lab Hours-Instructional Contact Hours**: 30-0-30

**Louisiana Common Course Number:**

**CIP Code:** 15.0404

**Course Description:** Introduces students to the equipment and methodologies used by the industry for monitoring performance and controlling processes. Topics addressed include common terminologies, basic principles of measurement and instrumentation, specific hardware, performance characteristics, control loops, typical applications and operating limits.

**Prerequisites:** PTEC 1013 (or PTEC 101) and PTEC 2033 (or PTEC 203) with grades of "C" or better

**Co-requisites:** PTEC 1322

**Suggested Enrollment Cap:** 15

**Learning Outcomes.** *Upon successful completion of this course, the students will be able to:*

1. Sketch a simple process diagram, including control loops, using knowledge of symbols, process diagrams, and instrumentation.

2. Describe the various process variables (flow, level, pressure, temperature, analytical, etc.) found in a plant and how instruments are used to sense, measure, and transmit this information to the control system.

3. Identify the types of control loops (simple and complex).

4. Identify the components of a closed control loop (primary element, transmitter, controller, transducer, final element) and their interrelationships.

5. Identify typical instrument malfunctions found in control loops and how they may affect a process (cause and effect).

**Assessment Measures.** Assessment of all learning outcomes will be measured using the following methods:

1. Assessment measures may include, but are not limited to, essays, presentations, speeches, portfolios, performances, individual and collaborative projects, in-class activities, lab reports, homework, computer-based training (CBTs) modules, quizzes, exams, industry-based standards, and/or simulated training activities.

**Information to be included on the Instructor’s Course Syllabi:**

* ***Disability Statement*:** Baton Rouge Community College seeks to meet the needs of its students in many ways. See the Office of Disability Services to receive suggestions for disability statements that should be included in each syllabus.
* ***Grading:*** The College grading policy should be included in the course syllabus. Any special practices should also go here. This should include the instructor’s and/or the department’s policy for make-up work. For example in a speech course, “Speeches not given on due date will receive no grade higher than a sixty” or “Make-up work will not be accepted after the last day of class”.
* ***Attendance Policy*:** Include the overall attendance policy of the college. Instructors may want to add additional information in individual syllabi to meet the needs of their courses.
* ***General Policies*:** Instructors’ policy on the use of things such as beepers and cell phones and/or hand held programmable calculators should be covered in this section.
* ***Cheating and Plagiarism*:** This must be included in all syllabi and should include the penalties for incidents in a given class. Students should have a clear idea of what constitutes cheating in a given course.
* ***Safety Concerns:*** In some courses, this may be a major issue. For example, “No student will be allowed in the lab without safety glasses”. General statements such as, “Items that may be harmful to one’s self or others should not be brought to class”.
* ***Library/ Learning Resources:*** Since the development of the total person is part of our mission, assignments in the library and/or the Learning Resources Center should be included to assist students in enhancing skills and in using resources. Students should be encouraged to use the library for reading enjoyment as part of lifelong learning.

**Expanded Course Outline:**

1. Course Overview & Introduction to Instrumentation
2. Soft Skills (Employability Skills)
3. Process Variables, Elements and Instruments – Pressure
4. Process Variables, Elements and Instruments – Temperature, Test Review
5. Process Variables, Elements, and Instruments – Level
6. Process Variables, Elements, and Instruments – Flow
7. Process Variables, Elements, and Instruments – Analytical
8. Miscellaneous Measuring Devices
9. Introduction to Control Loops
10. Control Loops: Primary Sensors, Transmitters, and Transducers
11. Control Loops: Controllers: Final Control Element Overview
12. Control Valves and Regulators
13. Symbology: Process Diagrams – Part 1
14. Process Diagrams – Part 2
15. Instrumentation Sketching
16. Instrumentation Troubleshooting