



## Syllabus

### SST 231 Smart Systems Technologies

#### General Information

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**Date**

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**Author**

Sam Samanta

**Department**

Science and Technology

**Course Prefix**

SST

**Course Number**

231

**Course Title**

Smart Systems Technologies

#### Course Information

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**Credit Hours**

3

**Lecture Contact Hours**

2

**Lab Contact Hours**

2

**Other Contact Hours**

0

**Catalog Description**

The 4th industrial revolution of cyberphysical systems, also known as Industrial Internet of Things (IIOT), is emerging from the 3rd industrial revolution spanning past 50 years which combined use of computers with robots. Students are introduced to characteristics of cyberphysical smart systems; and the role automation technologists play in prototyping, installation and maintenance of diverse systems in industrial ecosystems. Emerging smart systems technologies such as additive manufacturing, nanotechnology, MEMS, photonics, smart manufacturing, industrial cybersecurity, bigdata, artificial intelligence, and augmented virtual reality will be introduced. Student learn how the automation of data acquisition, analysis and control is essential for R&D as well as in digital transformation of industrial environments. The main topics covered are sources of signals, selection of appropriate transducers, and signal conditioning needed before signal is converted to digital format for cyberphysical data acquisition as required inputs for smart system technologies.

**Prerequisites**

MAT 152 or placement into Math Level 4, TECH 122, TECH 123, and SST 174

**Co-requisites**

None

**Grading Scheme**

Letter

#### First Year Experience/Capstone Designation

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This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

# SUNY General Education

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This course is designated as satisfying a requirement in the following SUNY Gen Ed category

None

## FLCC Values

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### Institutional Learning Outcomes Addressed by the Course

Vitality

Inquiry

Perseverance

Interconnectedness

## Course Learning Outcomes

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### Course Learning Outcomes

1. Students will articulate the socioeconomics of the 4th industrial revolution based on cyberphysical automation technologies.
2. Students will define the cyberphysical data acquisition requirements to specify tasks to be performed.
3. Students will simulate appropriate sensors, signal conditioning, and data acquisition hardware (e.g. LabVIEW and Multisim).
4. Students will construct and verify data acquisition systems.

## Program Affiliation

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This course is required as a core program course in the following program

AAS Instrumentation and Control Technologies

## Outline of Topics Covered

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- I. The 4<sup>th</sup> Industrial Revolution and Digital Transformation
- II. Cyberphysical Systems and Technologies
- III. Smart Manufacturing, Big Data and Artificial Intelligence
- IV. Industrial Internet of Things and Industrial Cybersecurity
- V. Sensors: Position, Acceleration, Strain, Load, Sound, Light, Voltage, Current, Flow, Temperature
- VI. Signal Conditioning
- VII. Digitization: Analog to Digital conversion
- VIII. Instrument Control: Digital to Analog Conversion
- IX. Hardware configuration
- X. Data and System Visualization
- XI. Signal Processing & Analysis
- XII. Documentation of Data Acquisition