**New York City College of Technology**

**Interdisciplinary Committee**

**Course Review Form**

**DATE:** Nov 13,2017

**REVIEWER:** Ezra Halleck

**COURSE TITLE & NUMBER:** PHYS 3600 Machine Learning for Physics and Astronomy

**PROPOSED BY:** V. Acquaviva (physics), A. Satyanarayana (CST)

**CREDIT HOURS:** 4 (3 credits)

**PREREQUISITES:** CST 1201 or equivalent introductory programming course, and MAT 1272 or equivalent statistics course

**COURSE IS:** X Existing New In development

**PROPOSED COURSE DESIGNATION**: X College Option elective Capstone other:

**DEPARTMENT HOUSED IN:** Physics

**PROPOSED STRUCTURE (e.g., co-taught, guest lecture, LC, other):**  co-taught

**CREDIT DISTRIBUTION** (if co-taught): 3 credits physics, 1 credit CST

**CATALOG DESCRIPTION:** The course focuses on problem solving in Physics and Astronomy through statistical inference, machine learning algorithms and data mining techniques.

Students will be presented with data sets and research problems in different areas of physics and will solve them using tools such as Bayesian statistics, Monte Carlo sampling, regression and classification algorithms, dimensionality reduction, and data cleaning. The programming assignments will be carried out in current, flexible languages, such as Python.

**DESCRIBE & EVALUATE HOW COURSE MEETS INTERDISCIPLINARY CRITERIA?**

The course is principally a physics course and the focus is on how use standard statistical tools to create, display and analyze data sets that in physics. Machine learning will be an advanced topic for the physics major and is the principal contribution provided by the computer system’s instructor.

**DESCRIBE & EVALUATE THE INTERDISCIPLINARY STRUCTURE?**

The strands from various disciplines (computer systems, statistics and physics) are well-integrated in the course outline.

**DOES COURSE MEET REQUIREMENTS FOR GENERAL EDUCATION?** Statistics and machine learning are fundamental to any student who wants to accelerate in the sciences in the coming decades.

**STRENGTHS:** Students will be excited to be working with real data sets generated by frontier-science efforts. This course will greatly expand their ability to do research while they are undergraduate students and beyond.

**WEAKNESSES:** none