**New York City College of Technology**

**Interdisciplinary Committee**

**Course Review Form**

**DATE:** May 10, 2018

**REVIEWER:** Sean P. MacDonald

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

**PROPOSED BY:** Viviana Aquaviva

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

**PREREQUISITES:** CST 1201 or equivalent, MAT1272 or MAT1372 or MAT 2572 or permission

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

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

**DEPARTMENT HOUSED IN:** Physics

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

**CREDIT DISTRIBUTION** (if co-taught): <insert>

**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?**

This physics course effectively integrates the perspectives and tools of statistics, mathematics and computer systems. In doing so, the course will now draw upon disciplinary experts both within and outside City Tech, with a focus on a variety of specific applied problems as they relate to the discipline of physics. The interdisciplinary structure of the course is unique in making connections across disciplines to involve students in applied problem solving.

**DESCRIBE & EVALUATE THE INTERDISCIPLINARY STRUCTURE?**

<**Consider:** The course involves an interdisciplinary perspective on machine learning in physics, bringing in the perspectives offered by mathematics, statistics and computer systems. These varied applied perspectives will enable students to focus on a unique approach to data analysis.

**DOES COURSE MEET REQUIREMENTS FOR GENERAL EDUCATION?** < see links for criteria CityTech: <http://www.300jaystreet.com/college-council/curriculum_proposals/past_proposals> NYS: <http://www.highered.nysed.gov/ocue/lrp/liberalarts.htm> >

**STRENGTHS:** Theinclusion of varied perspectives to problem solving and analysis offered by disciplines outside of physics offers a strong foundation for students that will enable them to work effectively across disciplinary boundaries and adopt a creative approach to the applied work of the course.

**WEAKNESSES: None**