

## Dean's Colloquium

Assistant Professor Dr. Janett Walters-Williams  
Department of Computer Science, Hampton University



**When: Wednesday, February 8<sup>th</sup>, 2023**

**Where: Turner 129**

**Time: 3:30 – 3:50 pm, Q&A: 10 min**

**Title: Increasing Students Expertise and Career Competencies Skills in Computer Science using Project-Based Learning and Blended Practical in a Cognitive Apprenticeship Framework**

**Abstract:** The digital revolution resulted in an increase demand for a computer science workforce prepared by universities and colleges. The Computer Science field is complex and unpredictable however, making it challenging to study and teach yet educators must prepare graduates who understand concepts, have practical network skills as well the necessary Higher Order Thinking Skills. This paper presents a case study, in Computer Network, utilizing a new methodology based on a merger of Project-Based Learning, Hands-on Learning, Simulation Based Learning, and the Cognitive Apprenticeship framework. It seeks to increase students' (i) expertise in Computer Network, (ii) self-efficacy and (iii) Higher Order Thinking skills level. After 3 years of implementation, analysis of results shows, despite the COVID-19 pandemic, that students (i) acquired and increased their domain knowledge, (ii) acquired procedural and processed knowledge while solving problems, in given scenarios (iii) increased their self-efficacy in Computer Networks and (iv) increased their Higher Order Thinking skills.

**Bio:** Dr. Janett Walters-Williams joined HU in September 2017 as an Assistant Professor of Computer Science. She pursued her doctoral degree in Computer Science at the University of Southern Queensland in Australia where she focused on Signal Processing using Machine Learning as it applied to the Biomedical field. Dr. Walters-Williams is the HU campus PI in the NASA University Leadership Initiative grant as well as the PI for a NSF IUSE:EHR grant funding the present research. Since coming to Hampton Dr. Walters-Williams as served as PI or Co-PI in several grants that focus on both Machine Learning as it applies to other fields as well as STEM education with the focus on methodologies. Her research in STEM Education has resulted in the

dissemination of material on the development of two new methodologies: **H-CUP** which seeks to teach Higher Order Thinking Skills (HOTS) to students using a merger of the Cognitive Apprenticeship (CA) Framework, Universal Design of Learning (UDL) and Project Based Learning (PBL) and **CAP-B** which is based on a merger of Project-Based Learning, Hands-on Learning, Simulation Based Learning, and the Cognitive Apprenticeship framework. In addition to her scholarly work, Dr. Walters-Williams serves as a panel team member for NSF, DOD - SMART, National Academy of Sciences, Ford Foundation and the NIH. She given more 10 presentations for both conferences and industry, authored/co-authored over 16 peer reviewed journal articles and has authored 1 book.