

**UNIVERSITY OF THE
DISTRICT OF COLUMBIA**
SCHOOL OF ENGINEERING AND APPLIED SCIENCES

SEAS Capstone Senior Projects

Monday, May 1, 2023

9:00am – 4:30pm

Engineering

Starting 9:00 and 1:30pm

Building 38/203 - Windows Lounge

Computer Science

Starting 10:00am and 1:30pm

Student Center A01 - Student Activities Lounge

Poster Session 12 noon – 1:30pm

Student Center - Heritage Hall



Capstone Projects

<https://bit.ly/3Hnsr6E>

SEAS Capstone Senior Projects – Monday, May 1, 2023

9:00am – 10:00am (45-minute presentation)

Civil Engineering Project

Title: *“Planning and Design of Civil Engineering Systems for the Spring View Sub-division”*

Students: *Eyob Alemu; Dawood Shah, Christine Hanna, Nimesh De Silva; Joshua Allen; Josue Melgar, Cedric Ouyi*

Advisors: Dr. Pradeep Behera, Dr. Bryan Higgs, and Dr. Hossain Azam

The civil engineering senior project involves three projects: (i) Small Site Development, (ii) Large Site Development -Planning and design of civil engineering systems for the 30 acres land development which include understanding the clients need, complexity of the problem, regulation requirements, planning, analysis, and design. The project develops alternative layout designs of the sub-division and selection of best layout that must include single family & multi-family residences, multi-storied office building, commercial area, and parking. The specific design project included structural design of a multi-storied building including foundation design, stormwater management of the proposed lay out, storm sewer system design, sanitary sewer system design and water supply system design and design of transportation system for the sub-division, planning, scheduling and cost analysis and environmental sustainability design.

SEAS Capstone Senior Projects – Monday, May 1, 2023

10:00am – 12 noon (20 minutes each)

Mechanical Engineering/Electrical Engineering - Joint Project

Group 1 **Title:** *“Unmanned Surface Vehicle for Bathymetric Mapping of Shallow Water Basins”*

Students: Steve Tagheu, Stephanie Sougre Rouamba, Obiara Mbanefo, Shavonne Fraley

Faculty Advisors: Dr. Devdas Shetty, Dr. Esther T. Ososanya

Electrical and Computer Engineering Projects

Group 2 **Title:** *“Remote Control (RC) Water Pollution Monitoring Bouy for Aquaponics Systems”*

Students: Kaieem Anderson, Seriphap Phomsavath, and Jennifer Dail

Advisors: Dr. Esther T. Ososanya, Dr. Tolessa Deksissa, Director of Water Resources Research Institute (WRII)

Group 3 **Title:** *“Design, building, and testing of nanoscale meta-material-based energy Sensors”*

Students: Arnold Feutmba and Bailey Garfield

Advisors: Dr. Pawan Tyagi, Dr. Esther T. Ososanya

Group 4 **Title:** *“Autonomous ‘GREEN’ Mower”*

Students: Devon Newman, Temeche Sisaye, and Phillip Wright

Advisor: Dr. Esther T. Ososanya

Group 5 **Title:** *“Acoustic Tracking of Pulsed Sources”*

Students: Vance M. Warren, Jr., and Javar Dougall

Advisors: Dr. Max Denis, Dr. Esther T. Ososanya

SEAS Capstone Senior Projects – Monday, May 1, 2023

1:30pm – 4:30pm (20 minutes each)

Biomedical Engineering Projects

Group 1: Title: “*Implementation of a UDC prototyping workflow for Ankle Foot Orthosis*”

Students: Tasneem Abdus-Shakur, J’niya Butler, Gloria Hernandez

Faculty Advisor: Dr. Ji Chen, Dr. Lara Thompson

External Sponsor: Walter Reed National Military Medical Center (WRNMMC) Educational Partnership Agreement

Funding Support: National Science Foundation (NSF) Award Abstracts # 2229575 and 1700219 and National Institutes of Health (NIH) 1R25AG067896

Funding Support: NASA-MIRO: Center for Advanced Manufacturing in Space Technology & Applied Research at UDC

Group 2: Title: “*Ultrasound Guided, Steerable Needle Biopsy*”

Students: Glacia Martin, Aliya Newby, Javaun Harriott

Faculty Advisor: Dr. Max Denis

External Sponsor: DoD

Mechanical Engineering Projects

Group 3: Title: “*Lunar Dust Tolerance and Mitigation of Space Suits Through Nano Fabricated Electrostatic Cleaning*”

Students: Voss Harrigan, Korey Carter & Marcus Gilmore

Faculty Advisor: Dr. Jiajun Xu

External Sponsor: NASA MUREP and NASA MINDS competition

SEAS Capstone Senior Projects – Monday, May 1, 2023

Group 4: **Title:** *“Application of Atomic Layer Deposition for Thin-Film Optical Coatings”*

Students: David Box, Hayden Brown

Faculty Advisor: Dr. Jiajun Xu, Dr. Fisseha Gebre

External Sponsor: Dr. Vivek Dwivedi from NASA Goddard Space Flight Center, NASA MUREP and NASA MINDS competition

Group 5: **Title:** *“Parametric Study of Additively Manufactured Lattice Specimen”*

Students: Ryan Walker, Chance Eden

Faculty Advisor: Dr. Jiajun Xu, Dr. Fisseha Gebre

External Sponsor: NASA MUREP and DoD

Group 6: **Title:** *“Design and Development of a 3D Printed Active Thermal Management System for Electromechanical Actuators (EMA) in Aircrafts”*

Students: Herve Sandja, Hamza Abdelaziz, Hans Matthew Baes, Abdulbasit Telha

Faculty Advisor: Dr. Jiajun Xu, Dr. Fisseha Gebre

External Sponsor: NASA MUREP and Airforce Research Laboratory

Group 7: **Title:** *“Design and Development of Continuous Sensor-Based Automatic Ink Flow System for Aerosol Jet Printer”*

Students: Patricia Beaubrune-Reese, Marilyn Andrade Guillen

Faculty Advisor: Dr. Devdas Shetty, Dr. Jiajun Xu

External Sponsor: DoD

SEAS Capstone Senior Projects – Monday, May 1, 2023

Group 8: Title: “*Additive Manufactured Electromagnetic Resistance Trainer for Microgravity*”

Students: Jason Alberti, Matthew Brown, Daniel Washington

Faculty Advisor: Dr. Jiajun Xu, Dr. Ji Chen

External Sponsor: NASA MUREP and DoD

Group 9: Title: “*Design Building and Testing of Nanoscale Metamaterial based Energy Sensors and Absorber*”

Students: Betelhiem N Mengesha, Juan Estevez Hernandez

Faculty Advisor: Dr. Pawan Tyagi

External Sponsor: NSF

SEAS Capstone Senior Projects – Monday, May 1, 2023

Computer Science - Senior Projects

Senior Project II (Completing Projects Session)

10:00am-10:20am **Title:** *“Ekub”*

Students: Temesgen Alemayehu, Alemitu Dereje

Faculty Advisor: Dr. Thabet Kacem

10:25am-10:45am **Title:** *“Quick Food”*

Students: Jose Solano, Matthewos Bisrat, Nicholas Yankey

Faculty Advisor: Dr. Thabet Kacem

10:50am-11:10am **Title:** *“Ethical Hacking: Exploits, Tools and Methodologies”*

Students: Carlos Palencia, Martin Castro, Aanuj Sharma, Mariah McKie, Itallya Taylor

Faculty Advisor: Dr. Thabet Kacem

11:20am-11:40am **Title:** *“The Turing Trick”*

Students: Basheerah Abdus-Shakur, Trent Peterson, Kanaetochi Okiyi

Faculty Advisor: Dr. Thabet Kacem

Senior Project I - Initiating New Projects Session

1:30pm-1:45pm **Title:** *“Neuro”*

Students: Karla Ferrel Castillo, Carlos Sac Mendoza

Faculty Advisor: Dr. Byunggu Yu

1:50pm-2:05pm **Title:** *“EDIR”*

Students: Kaleb Bekele, Samrawit Gebrehiwot, Menges Awel, Senait Gebreamlak, Anwar Degu

Faculty Advisor: Dr. Byunggu Yu

2:10pm-2:25pm **Title:** *“Personal Security Drone”*

Students: Caleb Kelly, Manuel Primentel

Faculty Advisor: Dr. Byunggu Yu