



Empowering STEM Educators Through Robotics and Automation

Robotics and Automation Outreach Program (RAOP)
NSF Robert Noyce Teacher Scholarship Program
Research Experiences in STEM Settings (RESS) | Howard University | AVRC Lab
NSF Award #2503860



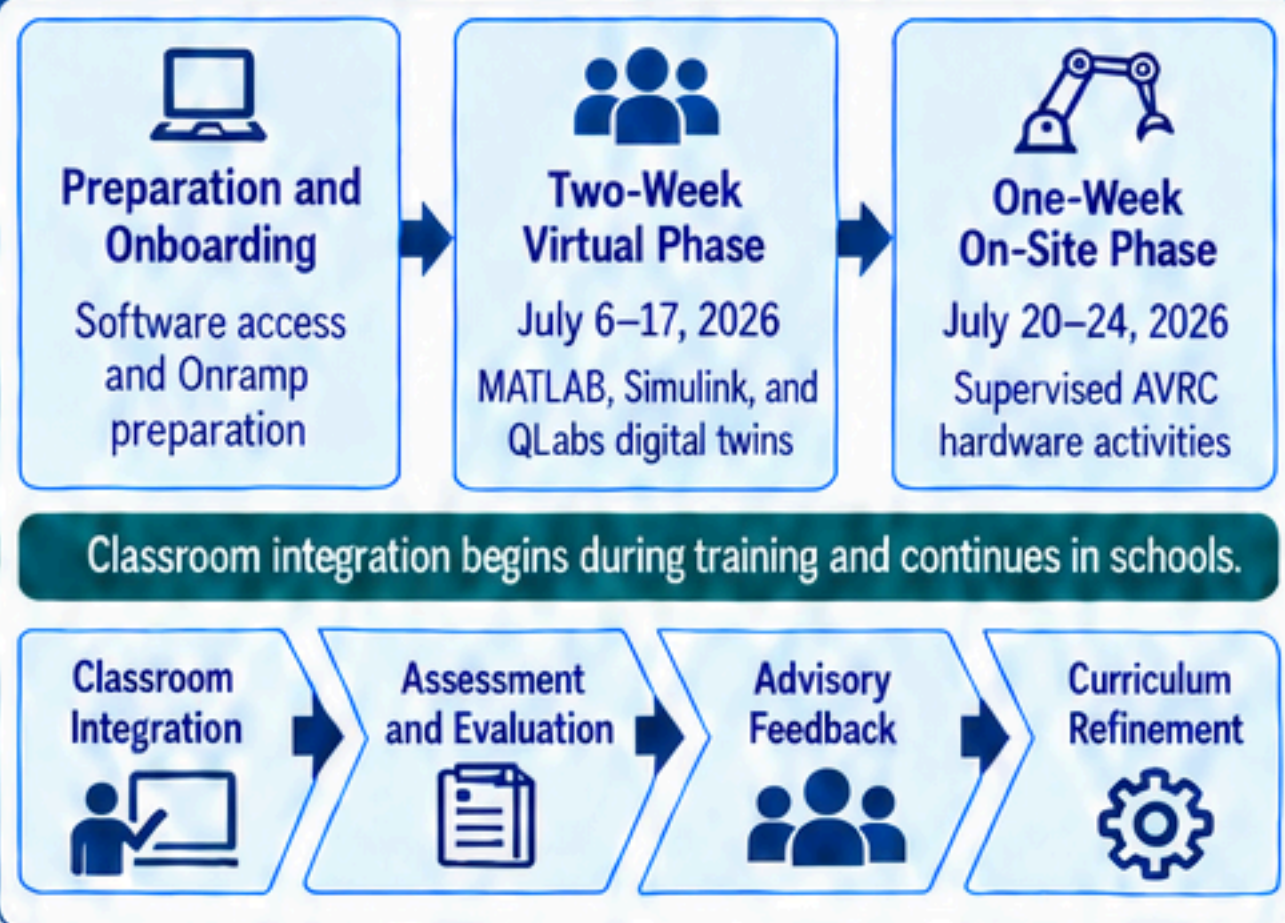
2026 Noyce Summit | Washington, DC | June 30–July 2, 2026
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PROJECT OBJECTIVES



- Research experience in robotics and automation
- Guided inquiry-based learning
- Digital-twin practice and hardware investigation
- Classroom, course, and club integration
- User-friendly, adaptable grades 6–12 curriculum

RAOP PROGRAM STRUCTURE



INTENDED PROGRAM OUTCOMES



- Educators connect robotics and automation research with teaching.
- Learning is adapted for courses, curriculum units, after-school activities, and clubs.
- Educator feedback informs an adaptable curriculum across five annual cycles.
- Assessment and follow-up document classroom use and guide improvement.

PROJECT INPUTS



- NSF award support
- Howard University faculty and AVRC Laboratory
- PI, co-PIs, advisory board, and training assistants
- Eight educators in the 2026 cohort
- Four core robotics platforms
- Quanser industrial partner: platforms, QLABs access, and technical resources
- MathWorks STEM Outreach License: MATLAB and Simulink

MathWorks license access was approved and shared one month before training for MATLAB Onramp and Simulink Onramp preparation.

PLATFORM ACTIVITY MAP

1		Qube-Servo 3	DC motor, encoders, and feedback
2		Aero 2	Rotor sensing, pitch, and yaw
3		QArm	Joint motion, manipulation, and sensing
4		QBot Platform	Mobile ground robotics and sensing

Introductory and advanced activities in virtual and physical settings. Assigned pairs during virtual work; all four platforms during on-site rotations.

IMPLEMENTATION FOLLOW-UP



October 2026: examine how educators use and adapt the learning in their schools.

ASSESSMENT AND EVALUATION: T1 – T6

T1	Setup Readiness Form	Before virtual instruction
T2	Virtual Lab Checkpoint Form	End of virtual phase
T3	Hardware On-Site Checkpoint Form	End of on-site phase
T4	Participant Feedback Survey	End of on-site phase
T5	Group Discussion and Classroom Translation Form	July 24, 2026
T6	Advisory Board Feedback Form	Initial and follow-up reviews

CONTINUOUS CURRICULUM IMPROVEMENT



Across five annual cycles: pilot, expand, evaluate, and refine an adaptable curriculum.