

The **Promoting Robotic Design and Entrepreneurship ITEST** project at NYU Tandon School of Engineering provides an experiential learning opportunity to high school teachers and students. Funded by the Division of Research On Learning of the National Science Foundation, under its *Innovative Technology Experiences for Students and Teachers* program, this project aims to enhance education in high school classrooms by providing professional development (PD) to teachers and educational enrichment to their students in robotic design and entrepreneurship. The project design adapts features from evidence-based research on project-based learning (PBL), robotics and entrepreneurship in K-12 STEM education, social cognitive career theory, and effective PD guidelines embedded in a professional learning community (PLC). Experts in robotics, entrepreneurship, curriculum design, and assessment-with experience in K-12 education and training-have formed an interdisciplinary team to transform students' roles from technology consumers to novel technological product creators. Planned activities include:

- A 4-week summer institute with a 2-week guided training and a 2-week robotic design experience
- Academic year (AY) follow up in schools through an elective course
- A robot product design and business idea competition

BENEFITS TO PARTICIPANTS

- Formulating robotics activities in a PBL framework will help participants to learn content and thinking strategies and foster their higher-order cognitive skills
- Integration of PBL with entrepreneurship will address participants' fear of failure, lack of confidence, and creativity and communication skills
- Deepen teachers' technical, pedagogical, and content knowledge, contextualized in and reinforced through robotics design experiences
- Use robotics as a means to expose teachers to tools, techniques, and models of authentic engineering design

BENEFITS TO SCHOOLS

- Design of effective PD will support transfer of training through content-immersion, allow modeling and rehearsing of desired skills, last for sufficient duration to handle cognitive demands of new learning, and facilitate classroom adoption through a PLC
- Develop and refine curricula that promote project-based, hands-on, instruction to ensure that students learn, understand, and apply the underlying science and math content while doing age-appropriate robotics activities
- Foster teachers' skills and attitudes for integrating robotics-based learning in the required science and math classes

ELIGIBILITY

- Regular teaching appointment at a high school located in New York City (all five boroughs), Long Island, Westchester, or New Jersey (within commuting distance)
- Three years of full-time teaching experience in physical sciences, math, or pre-engineering disciplines
- Endorsement by the school principal

DURATION

- Four weeks: July 8, 2019—August 2, 2019
- Schedule: Monday to Friday, 8:30 A.M.—5:00 P.M., on NYU School of Engineering's 6 MetroTech campus

STIPEND

Project teachers who successfully complete all requirements (see responsibilities below) will receive a stipend of \$3,750. Summer student participants will receive a stipend of \$500 each. Income tax obligations are the responsibility of the participants.

RESPONSIBILITIES

To receive a full stipend, participants are required to:

- Attend all training activities
- Complete assigned engineering design, prototyping activities, presentation, reporting, and project web page
- Participate in academic year follow-up activities (implement an elective robotics course and a capstone design project, and participate in an annual robot product design and business idea "Inno/Vention" contest at NYU)
- Conduct assessment of project impact in their classrooms and provide the results for reporting to NSF

SELECTION

Each school must submit a complete application package for a pair of teachers from physical sciences, math, or pre-engineering disciplines. A complete application package consists of the application form, résumé, essay, and reference letters. Applications may be hand delivered, mailed, e-mailed, or submitted online. Finalists for the 2019 project will be announced on the project web site by May 10, 2019. Following the selection of teachers, schools will be asked to select a gender-balanced group of four students/school for the summer program.

APPLICATION DEADLINE:

April 22, 2019

Online: <http://engineering.nyu.edu/k12stem/educators/>

ITEST Open House:

Information Session on February 27, 2019 @4:30pm

CONTACT INFORMATION

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Promoting Robotic Design and Entrepreneurship ITEST

APPLICATION

Type or print neatly

Date: _____ Gender: M/F

Name: _____
Last First Middle

Position: _____

Department: _____

School: _____

Mailing Address: _____
Street

City State ZIP

E-Mail: _____

Phone: _____

Fax: _____

Home Address: _____
Street

City State ZIP

Principal's Endorsement/Signature

APPLICATION CHECKLIST

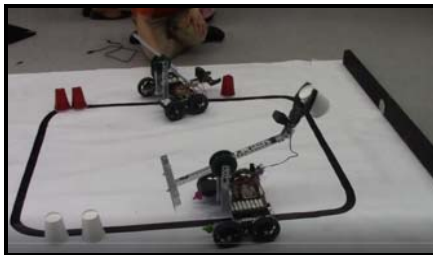
- Résumé which includes information stating your
 - Education
 - Professional experience with relevant teaching history
- Essay (300-500 words)
 - Based on your experience, what integrative robotics, STEM, and entrepreneurship concepts do you wish to demonstrate to your students? How will this create an exciting learning activity for students?
 - What robotics learning resources do you use at your school for hands-on learning activities? How have you developed an engaging curriculum using these resources?
 - Detail how you will incorporate robotics in your instruction to enhance STEM education after participating in this project.
- Two reference letters from your
 - Principal-committing to allow you to offer a robotics elective course and a robotics capstone design course
 - Assistant-principal, department head, or a senior colleague who can comment on your professional background and future outlook

Online submission link:

<http://engineering.nyu.edu/k12stem/educators/>

Detach ✂

Promoting Robotic Design and Entrepreneurship Experiences among Students and Teachers



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“Promoting Robotic Design and Entrepreneurship Experiences among Students and Teachers,” effort will design, implement, and assess an ITEST project that will provide professional development (PD) to high school teachers and educational enrichment to their students within a project-based learning (PBL) framework focused on robotic design and entrepreneurship. During each of the three project years, 2017—2019, under the guidance of 1 PI, 4 co-PIs, and 3 senior personnel, 16 teachers and 32 students from 8 high schools will be recruited.

Planned activities include: a 4-week summer institute with a 2-week guided training and a 2-week robotic design experience; academic year (AY) follow up in schools through an elective course; and a robot product design and business idea competition. During the AY, each school’s two teachers will conduct a robotics course for at least 25 students. In the annual grand finale, school teams will compete in a robot product design and business idea contest, modeled after the Inno/Vention contest coordinated by the Incubator Initiatives of NYU Tandon School of Engineering (NYU Tandon). Experts in robotics, entrepreneurship, curriculum design, and assessment-with experience in K-12 education and training-have formed an interdisciplinary team to transform students’ roles from technology consumers to novel technological product creators.



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by **The National Science
Foundation**

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NYU Tandon’s Center for K-12 STEM Education
**NYU Tandon’s Centers for Entrepreneurship &
Technology**