

# Nomination Form: 5573

Lee, Douglas

## Page: Nomination Form

### Nominee's First & Last Name (or contact name for nominated company)

Lee, Douglas

### Nominee's Business Title

Director of Technology/ Computer Science & Engineering

### Nominee's Company Name

Dallas International School

Please select the nomination category

### Category

Tech Titans of the Future High School Level

- The teacher is a high school math or science teacher in a North TX public or private high school (grades 9-12).
- The teaching technique or program must demonstrate opportunity for students to gain applied knowledge.
- The nomination requires two student testimonials by two current or former students. [Click here to download testimonial from.](#)
- Only one teacher per high school may be nominated. (Must have approval of teacher's principal)

### Nominations will be judged on the following criteria:

- The teaching technique/program demonstrates an inspired and novel approach to teaching math or science and quantifiable/measurable results of significant success in student learning of math and/or science. (40%)
- The teaching technique/program demonstrates evidence that the teacher has had a positive impact on student interest and career decisions in STEM (science, technology, engineering or math). (40%)
- The student testimonials demonstrate a high impact on the student's educational experience and the student's commitment to a college degree and career in STEM (science, technology, engineering or math). (20%)

**Is the nominee a High School Teacher? (Grades 9-12)**

Yes

**School Name**

Dallas International School

**District (ISD)**

Private

**Check one**

Science Teacher

**Number of years teaching**

4

**Name of teaching technique or program**

International Baccalaureate

**Principal's Name**

Dr. Francois Pave

**Does the nominee or nominator have approval from the High School principal to submit a nomination?**

Yes

**1. Describe the innovative teaching technique and/or program. (40%)**

Mr. Lee understood there would be challenges to attracting students to Computer Science and Engineering subjects. As a result, he almost single-handedly built the DIS Computer Science and STEM programs and mentored the students with an experiential approach. He combined bringing industry experience into the classroom with students practicing their systems building knowledge and transformed the school into a lab for students to employ what they learned.

The first way he did this was by having students learn networking by designing, simulating and implementing a large-scale network. Mr. Lee had the students literally take over an empty floor at the school and setup LANs, VLANs, simulated a point-to-point VPN and install VoIP telecom equipment, computers and servers. The students became network engineers tasked with connecting a main office to a branch office for its users to collaborate. During the course of the year, students were given the task of physically laying down network cabling to connect under-serviced areas on campus. The opportunity was to learn various network technician skills such as crimping, testing new cable, understanding how the concepts of switching and routing work in a large networking environment and how technicians trace cabling problems and why problems

occur. This lab exercise was very much hands-on and typical of what you may see in an industry setting, including all the setbacks and successes achieved.

Secondly, Mr. Lee taught Computer Architecture by having students build their own server.

Mr. Lee also brought industry experience into the classroom, highlighted by open discussions about the business of computer science. There was a big emphasis on how everything we learn and the decisions we make can affect things like system performance, business decision making, overall effectiveness of a product or service and even customer satisfaction.

Mr. Lee arranged many guest speakers to talk to students on relevant subjects. They enjoyed guest speakers ranging from an active duty US Army captain in Cyber security, Cyber defense and anti-terrorism (military perspective) to a former CEO/entrepreneur of a large corporation specializing in Cyber defense of intellectual and economic property (civilian perspective). All the guest speakers had years of experience the students found fascinating and reinforced their goals for entering a STEM field (military or civilian).

The other area of focus was Computer Programming, which starts in middle school and continues into High School. In this area, Mr. Lee emphasized a hands-on approach to teaching electronics, robotics, and Internet of Things (IoT) using the Arduino microcontroller, Raspberry Pi and electronic sensors.

As a result, some of the projects students created include:

- Autonomous rovers with hazard avoidance
- Smartphone and Bluetooth remote controlled rovers
- Remote weather monitoring station
- Automated gate system for a hog pen in a remote location with cell phone/text notifications
- Image recognition of dogs using Neural Networks with MatLab
- Microcontroller midi sequencer
- Wireless activated door locking/unlocking system
- Transistor and relay remote control device for simple DC motors

Mr. Lee is always thinking about how to expand computer science and engineering studies. He will be introducing basic control theory during the next school year, which will give high school students a taste of engineering systems. It will be a hands-on approach, having students build and program a basic controller using microcontrollers and gyros/accelerometers to control naturally unstable systems like drones, self-navigating and self-balancing rovers and lighter-than-air vehicles. He will then expand the current lesson module on databases to include the value of data and data analysis, giving the students a more holistic insight.

## **2. Describe how the teaching technique or program impacts student decisions or interest regarding further educational and/or career pursuits in STEM. (40%)**

Mr. Lee wants his students to be engaged in their classes and wants them to know the reasons why they learn the subjects they learn. He realizes that students want to know the experience of what life is like after completing their academic studies and as they enter into a career.

Mr. Lee has been highly successful in getting his students engaged because of his hands-on technique. The topics are not esoteric, and the teaching methods he utilizes in his classes are relatable to actual experience. He is committed to reinforcing the ideas that are taught with practical real-world examples, whether by bringing in guest speakers, designing labs that allow students the freedom to put those lessons learned into practice, or even simply relating personal stories gained from professional experience. It has further reinforced the students' commitment to a STEM career path. Students become excited and look forward to their next academic opportunity beyond high school and into university. In fact, several of Mr. Lee's current graduating students will pursue computer science or other STEM topics at University.

## **3. Additional comments related to nomination.**

One of the most exciting projects Mr. Lee implemented at DIS was leading the Computer Science students at the Consumer Electronics Show (CES) in Las Vegas for two years in a row (2017 and 2018). When Computer Science was first offered as an elective at DIS, there were very few students interested. Other electives had exciting, fun trips for students, so Mr. Lee wanted a way to attract students to his program and offer them insight into what it is like to pursue a career in the STEM area---and that is when he created the CES project.

The goal for this program was for students to experience the emergence of cutting edge consumer electronics, technology and engineering in order to discover the business and marketing aspect of technology.

The students were assigned the task of covering the multi-day event as media representatives. This included setting up and arranging video interviews with designers, engineers and company representatives regarding their products and businesses. They created unbiased public reviews in video blog and written blog forms for general public consumption and then wrote, edited, produced and starred in them.

Ultimately, there were many life lessons learned, including gaining business experience with established professionals in a live environment. Students had to perform public speaking on the blogs and during the recording of interviews, as well as manage their time and meet strict publishing deadlines.

This real-world experience is unique at a high school level and will remain a lasting legacy for these students.

## **Attach a lesson plan**

[Download File](#)



## 2018 TECH TITANS OF THE FUTURE HIGH SCHOOL LEVEL STUDENT TESTIMONIAL FORM

The **Tech Titans of the Future High School Level** award recognizes a high school (grades 9-12) math or science teacher for development and implementation of an innovative teaching technique or program that inspires student interest regarding further educational and/or career pursuits in science, technology, engineering or math. The teaching technique or program must demonstrate opportunity for students to gain applied knowledge.

### ***Teacher Information***

Teacher's Name	School
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### ***Student Information***

Student's Name	Email*	Phone*
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Current School	Current Grade Level	
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*(\*for judges' use only)*

**In the space provide describe** the impact this teacher had on your educational experience and how this teacher impacted your decision regarding further educational and/or career pursuits in science, technology, engineering or math.