# TSAcolor

# 2017 NJ TSA HIGH SCHOOL STATE CONFERENCE DESIGN PROBLEMS

**Coding**

Please note: the Coding event has been **changed from a Static Event to an On-Site Event.** The design problem will be given on conference day. Please read the below information carefully so that you are prepared for the On-Site competition.

**Coding – Revised 1/16/17**

**On Site Event**

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| **OVERVIEW**: | No change. Participants solve a problem On Site and **must bring their own computer hardware and software.** |
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| **ELIGIBILITY:** | 2 teams of 1-3 members per chapter (a team can be made up of 1 member). |
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| **TIME LIMITS** | No semifinalists. No LEAP interview. Teams have two (2) hours to design and construct solution to On Site problem. |
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| **LEAP LEADERSHIP RESUME/INTERVIEW** | LEAP Leadership Resume submitted at check-in. No semifinalists. No LEAP interview. |
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| **PROCEDURE:** | F-H. No semifinalists. No LEAP interview.  **Teams must bring their own computer hardware and software.** |
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| **REGULATIONS:** | F. LEAP Leadership Resume submitted at check-in. No semifinalists. No LEAP interview.  ***No school or individual names labeled on projects; only ID#’s are to be used.*** *Upon registering students online, they are automatically assigned an ID#.* ***This number needs to be on student projects.*** |
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| **EVALUATION:** | Evaluation is based on 90 points:   * Solution (30) * Testing of Solution (50) * LEAP Leadership Resume (10)   No semifinalists. No LEAP interview. |

**Computer-Aided Design (CAD), 2D, Architecture**

Design Problem:

Cape May, New Jersey, is known for its Victorian style homes and the U.S. Coast Guard base, where all new recruits spend two months for their initial training. Thousands of people visit the Cape May community each week, year-round.

Design Brief:

A local couple wants to build a new Victorian style home near the base that includes a first floor owner’s suite, plus three second floor bedrooms designed for Airbnb rental. In addition to the owner’s suite, the first floor should include a great room, community kitchen designed for eight (8) guests, and a half bath.

The home you design should be energy efficient and include 2,000-2,200 square feet of heated space.

Specifications/Drawing Requirements

* Working drawings that include a floor plan as well as front, side and rear elevations;
* Include notes that identify at least five (5) Victorian features included within the interior and/or exterior, and five (5) energy saving features;
* Proper scale, dimensions and notes; and
* The maximum paper size is 24” 36” or smaller sheets mounted on a 24” x 36” sheet with no overlapping papers.

**Computer-Aided Design (CAD) 3D, Engineering**

Design Problem:

Unmanned aerial vehicles (UAV’s) are important to the U.S. military, companies such as Amazon.com and hobbyists. Eventually, they may also be used by the United States Post Office for Express Mail and package delivery. UAV’s can be piloted remotely, or fly autonomously.

Design Brief:

Design an affordable, four (4) motor minicopter using “off the shelf” parts. It should be designed to transport a standard #10 envelope, weighing up to three (3) ounces, the length of a regulation football field (100 yards).

Specifications/Drawing Requirements:

* Include a parts list that identifies the source of all required mechanical and electrical components, as well as frame materials;
* Show frame construction, the receiver, motor mounts and how the envelope is held;
* Drawings should show the top and bottom of the minicopter;
* Include any views or renderings that will enhance the presentation; and
* Maximum paper size is 24” x 36” or smaller mounted on a 24” x 36” sheet with no overlapping papers

**Optical Engineering**

Design a security system, or device, that meets the needs of a high school student. The device should be easy to install and mobile, so that it can be used in more than one place.

Please note:

Edmond Optics will provide each participating team with up to $50 of Optics for their entry. Optics may be purchased from the clearance section of the Edmund Optics website: <http://www.edmundoptics.com/clearance-products/optics/>

To order your optics, simply fill out the “Donation Request Form” found here:

<http://www.edmundscientific.com/donation>

**System Control Technology**

One of America’s largest home builders wants to encourage its potential buyers to purchase smart home options for their new homes. Design and construct a small model to display in the builder’s sales office. The model should show the potential buyers at least four (4) smart home features such as electronic door locks, thermostat controlled ceiling fans, skylights that close when it rains, blinds that close when it gets dark, and security systems.