

DelMarVa Council STEM Pro Series

November 3 & December 1

2018

Philosophy: STEM (Science, Technology, Engineering, and Mathematics) is receiving increasing academic focus in schools as employer demand for workers with STEM knowledge continues to increase. Boy Scouts of America has met these demands by building STEM into many areas of the Boy Scout advancement

Objective

- Primary objective - increase interest in STEM for Boy Scouts age 13 and older
- Create an intensive hands on with area experts
- Secondary objective - provide a motivated scout with opportunity to earn a STEM merit badge. Additional time with counselor may be required.

Please check back to the event guide for any updates to STEM session requirements. Some sessions require a permission slip to visit the Work sites.

Table of Contents

- [Date Location](#)
- [Registration](#)
- [FAQs](#)
- [STEM Course summary](#)
- [Permission slips](#)
- [Counselor Information](#)

DATE / LOCATION

STEM Pro Series will be held on two Saturdays in the Fall of 2018. Saturday November 3rd and December 1st. We will meet at Delaware Technical Community College - Stanton Campus, 400 Stanton Christiana Rd, Newark, DE 19713.

Sessions will last 2.5 hours.

1. Registration 8-8:30 followed by opening
2. Morning sessions run from 9 to 11:30 AM.
3. Lunch is from 11:30 to 12:15
4. Afternoon sessions are 12:30 to 3 PM

The information contained in this event guide should provide you with the necessary details for the weekend event. However, should you have any questions or require additional information, please do not hesitate to contact Nick Henry at (302) 530-8276 or by email at nhenry@dmvc.org or Maureen Stone 302-983-0887 stone.maureen22@gmail.com.

Registration

Registration for this event can be done online: [STEM registration](#)

Registration for the event closes on October 15th. Late registrations please contact Maureen Stone (302) 983-0887.

*Please take note of STEM/Merit Badge schedule when registering for this event. Some Merit Badge offerings may have prerequisites. Digital Technology requires a cyber chip card.

Cost

The cost for this event is \$15. This price is the same for one or two STEM study areas and includes the cost of the patch. Additional patches cost \$3 per patch, supplies limited. **Register using the following link:** delmarvacouncil.org/stempro

Event Information:

- Suggested for Boy Scouts ages 13 and above.
- Maximum of two (2) STEM/merit badge areas per scout.
- Subject sessions will involve a combination of interactive, discussion, hands-on learning, internet deep dives, and possibly field trips.
- Class sizes will be limited by each counselor to increase individual participation and discussion.
- Scouts will likely need to accomplish work outside the sessions in order to complete the merit badge requirements for the STEM area chosen. This may well involve a separate live discussion with the counselor outside of the event.
- Full scout uniforms required. Merit badge books recommended.
- Cyber Chip required (Bring your card.)
- Completed and signed MB “Blue Cards” from the scout’s unit leader is required.
- Brown Bag Lunch

Please bring any permission slips required for site visits on November 3rd

STEM Study Areas Offered

- Archeology Delaware Archeology Society - Craig Lukezic
 - Work with Delaware State Archeologists
 - Learn how to secure an historical site
 - Go on a dig with state archeologist (available in the future)

- Automotive Maintenance; Delaware Technical Community College
 - Frank Adkins, Department Chair DTCC
 - Do you have a knack for taking things apart and putting them back together again? Ever wanted to fix your own car. What are all those images on my dashboard? What is an automotive technician all about?
 - This program will provide you with a practical hands-on approach to the automotive repair industry through systematic classroom instruction, completion of required labs, and an internship with a local business.
 - Come learn from the Del Tech Automotive Team
- Aviation
 - Rebecca LaMont Associate Technical Fellow; Boeing
 - What is vertical lift? Let's make an airplane fly. Learn how and why planes stay aloft. Experiment with wind design and flight.
- Chemistry
 - Ryan Hamilton PhD, DABT
 - Senior Regulatory Toxicologist
 - Chemicals are in the things we eat and most of the items in our homes. What is a chemist and where do they work?
 - Let's explore how chemicals affect our world.
 -
- Composite Materials (**permission slip required**)
 - Joseph Dietzel, PhD, Senior Scientist, Center for Composite Materials at U. Delaware
 - Composites save lives every day. We use composites in aircraft, automobiles and our military uses composites.
 - The University of Delaware Center for Composite Materials is a world-renowned research center that carries out basic and applied research in the area of composite materials and manufacturing. Over the past decade, we have been proud to partner with the Boy Scouts of America to provide a workshop that introduces Scouts to the fundamental concepts behind the design, fabrication, and testing of composite materials. Detailed discussion of the wide variety of applications in which these materials are used is also a key part of the workshop curriculum. The event is carried out over two weekends,

where Scouts get hands on experience fabricating composite picture frames and beam structures. The highlight of the program is on the second weekend where the Scouts participate in a competition to determine whose beam structure exhibits the greatest strength to weight ratio! Over the course of the workshop, participating Scouts will complete their requirements for the Composites merit badge. UD-CCM is proud to partner with the BSA in providing Scouts with access to world-class research facilities and cutting edge materials technologies that will shape tomorrow's world.

○

- Digital Technology
 - Nick Fuhs. Hotwire Communications.
 - In this STEM area the participants will create their own network and learn what a home network looks like.
- Electricity
 - Stephen Monaghan, P.E., Applied Control Engineering
 - Dave Rowe Applied Control Engineering
 - Scouts will have an opportunity to learn about and explore the wonders of electricity. After a lesson on electrical safety, the scouts will explore topics including the differences between alternating and direct current, power creation, power transmission, electrical power distribution, and basic home wiring. During the hands-on portion we will use standard home equipment and fixtures (circuit breaker box, 2-way light switch, 3-way light switch, lamp, etc.) to wire up electrical circuits while teaching the scouts about the National Electric Code and good wiring practices.
 - On the second day we will explore the use of electricity in industry. Using industrial equipment, the scouts will explore how electricity is used in manufacturing facilities to automate the control of manufacturing equipment.
 - Scouts will be given blue cards for the Electricity merit badge and will have multiple requirements signed off during this event but this course will strive to dive deeper than the merit badge. Scouts should leave this two-day course with a strong understanding of electricity,

practical skills like cutting, stripping, and landing wires, and hopefully an interest in completing the merit badge and continuing to explore the field of electricity.

- Energy

- Cory Budicshak, Department Chair DTCC

- Come explore the world of energy including energy efficiency and alternative energy sources in the Sustainable Energy Training Center. Where does energy come from? What are the many forms of energy? How is it used? How is it changed from one form to another? How is it stored and at what cost? What is efficiency? You will take part in many experiments and activities answering these and other questions. Activities may include: building solar cars, wiring simple circuits, building wind turbines, and more. You will also discuss the educational and career opportunities in the energy field. Motivated participants can earn the Energy merit badge which will require some work outside the 2 sessions. This STEM area is led by the Delaware Technical and Community College Department of Energy Management.

- Forestry

- Karl Zipf, Chemist Delaware Department of Transportation
 - Trees, Wood Leaves. Is that all there is to a Forest. Forests are integral to the life of our planet and provide more than just a place to go camping
 - How do you bend wood? This and more.

- Medicine

- Nursing Department DTCC Nursing and Christiana Care

- Nuclear Science

- Ron Duwell former Naval Officer on Nuclear Submarine
 - Alex Rittberg

- Let's Build a Nuclear Reactor!!! Nuclear science STEM will explore atoms through fun interactions, demonstrations and hands-on experience. Learn about different types of radiation and how they can be used to improve life on earth. Maybe start your career in the nuclear field.
- Plant Science (**permission slip required**)
 - Lisa Hoffman Technical Manager at FMC
 - Everyone everywhere relies on plants! From the food that we eat to the clothes that we wear and the medicines that we take, life depends on plants. Every time you eat a hamburger, wear your favorite pair of jeans or play your favorite outdoor sport, you have a plant to thank. You should also thank plants for some of the medicine that you take, and for the very air that you breathe and the water that you drink. Without plants, the world as we know it would come to an end. The agronomists, plant and soil scientists who study soil management and crop production, in FMC's Ag Solutions division are committed to the science-based solutions needed to feed a growing world population. If you are interested in learning more about why plants are the basis of life as we know it and what we do here at FMC, **please join us for two upcoming workshops that will lead to a merit badge in plant science.**
 -
 - Week 1/Session: "Thank a plant: An Introduction to Plants and the Science of Agronomy". In the first week, you will explore the many ways that people rely on plants and their role as the anchor of all food chains. You will create your own "Frankenstein" plant via grafting while learning about the structure of plants and plan your own science experiment while studying seeds and what factors favor seed germination.
 -
 - Week 2/Part 1: "Let's Get Dirty: Soil Science and Crop Fertility". If you love to play in the dirt, this one is for you. You will explore different soil types and soil characteristics and study their relation to crop health and yield. This will be a messy one, so please wear old clothes!
 -
 - Week 2/Part 2: "Plants get sick, too: Plant Diseases". Did you know that plants get sick just like people and animals? Specialized agronomists, called plant pathologists, are the plant doctors of the people world. But unlike people, plants can't tell us what hurts, so plant pathologists study the symptoms and signs of sick plants. You will explore several diseases of wheat and conduct an experiment on how they spread.
 -
 - Week 2/Parts 1 and 2 will be held at FMC's Stine Research Center in Newark, DE (1090 Elkton Rd, Newark, DE 19711) **and will include a brief tour of the biology facility.**
 -
- Veterinary Medicine, Caroline Wieczorek Schmelz, DVM

- **House Call Pet Doctor, we treat your pets like the valued family members they are.**
- Who doesn't like animals? What does it take to make your pet well again? Learn how to care for your pet and keep them healthy.

Permission slips

- 1. Plant Science - FMC**
- 2. Composite Materials - Ud-CCM**
 - a. Model release form**
 - b. Composites minor release form**
- 3. Delaware Technical Community College**

Frequently Asked Questions

How do I sign up?

- Go to [this link](#) and register online. **ADD SIGN UP**

Do I need to wear a uniform?

- Yes all scouts wear a full class A uniform.

Who gives me a Blue Card?

- You bring a signed Blue Card from your Scoutmaster. Your counselor will fill out the blue card as you complete your activities each session.

Do I need the merit badge book?

- Books should be purchased and read ahead of time at the Scout Shop.

Who can participate in this Program?

- Program is designed for Scouts age 13 and up.

How many Merit badges can I earn?

- Two merit badges per scout, maximum.

Will I finish in two sessions?

Some sessions will require outside research or a field trip.

Who needs the Cyber Chip?

- All scouts earning the Digital Technology MB. Scouts need to have Cyber Chip to earn the Scout Rank and Star Scout Rank. Go to this page for more details [cyber chip](#)

What can we do for lunch?

Brown Bag

Counselor Information

Purpose: To provide older scouts with an opportunity to more deeply explore specific STEM knowledge areas with local subject matter experts while having an opportunity to earn an associated STEM merit badge.

Philosophy:

- STEM (Science, Technology, Engineering, and Mathematics) is receiving increasing academic focus in schools as employer demand for workers with STEM knowledge continues to increase. Boy Scouts of America has met these demands by building STEM into many areas of the Boy Scout advancement program, interest areas and troop theme ideas.
- DelMarVa Council seeks to develop a 2018 STEM Pro Series event over 2 weekends (**November 3rd and December 1st**). This event is primarily aimed at increasing interest in various STEM areas with Boy Scouts 13 and older by providing focused interactions with area experts. A secondary objective of the event is to provide a motivated scout with the opportunity to earn a STEM merit badge in that area.

Subject Matter Expert / Merit Badge Counselor Information:

1. You create the curriculum and the breadth / depth of the discussions.
2. You decide upon the class size (estimated 10 scouts), space requirements. You are encouraged to work with others to create and lead the program.
3. There will be two separate 2.5 hour sessions, one in the morning and one in the afternoon; each STEM area will take on either a morning or afternoon session. To increase the number of scouts that can participate in your subject area, you might consider running both a morning and an afternoon section.
4. Your sessions should be much more than a classroom style lecture. Demonstrations, interactive discussions, design-and-build activities, experiments, internet resources, multi-media experiences, field trips, multiple stations, multiple subject matter experts are all greatly encouraged. You may want to consider including several associates to help you in planning and delivering the program.
5. Utilize your contacts at local companies, universities, etc., to provide you with enrichment activities, equipment, field trip opportunities, and other needs.
6. The Merit Badge requirements are a guide for your sessions, but the sessions should go beyond them in terms of discussion, materials, activities and such. The primary objective is a broader appreciation of the STEM knowledge area, its applications and career opportunities.

7. Merit Badge philosophy: All requirements must be fully completed for a scout to earn the badge. A counselor can't add or subtract from the current written requirements. Pay attention to the verbs used in the requirements (i.e. describe, explain, list, discuss, demonstrate, do, build, etc.); a scout simply attending a lecture seldom meets a requirement. It is expected that scouts will need to work outside the session and also have a real time, 1-to-1 discussion with the counselor in order to complete the requirements. Partial completions are acceptable to give at the end of the 2nd session with an opportunity for the scout to complete the MB with you at a later date. [BSA MB requirements.](#) [Boy Scout NOVA Award requirements](#)
8. The council can help you register as a MB counselor and direct you on taking Youth Protection (required).
9. Wireless internet is available.

Event Information:

- Suggested for Boy Scouts ages 13 and above.
- Event held at 400 Stanton Christiana Rd, Newark, DE 19713
- Maximum of two (2) merit badge areas per scout.
- Subject sessions will involve a combination of interactive, didactic discussion, hands-on learning, internet deep dives, and possibly field trip
- Class sizes will be limited by each counselor to increase individual participation and discussion.
- Scouts will likely need to accomplish work outside the sessions in order to complete the merit badge requirements. This may well involve a separate live discussion with the counselor outside of the event.
- Full scout uniforms required. Merit badge books required.
- **Cyber Chip required. (Bring your card.)**
- Completed and signed MB "Blue Cards" from the scout's unit leader are required.
- Brown Bag Lunch

[Delaware Technical Community College – Stanton Campus](#)

400 Stanton Christiana Rd, Newark, DE 19713