

# COMPOSITE STRUCTURAL ENGINEERING TECHNOLOGY (CSET) COURSE

MARCH 9 - JUNE 7, 2020



## **Learn the framework for substantiation of composite aircraft structure!**

This course covers topics such as Composite Applications; Material, Processing, and Fabrication Development; Design Development; Structural Substantiation; Manufacturing and Maintenance Interface; and more! Through on-line discussions, you can interface with expert structural engineers from industry and the FAA. You may choose to apply course principles in an optional hands-on laboratory to practice principles of engineering, manufacturing and maintenance of composite structures. Upon successfully meeting course requirements for the prerequisite material and structural engineering course, you will receive a certificate of completion.



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# ABOUT THE COURSE

This course covers the essential topics pertaining to composites engineering and the certification process. Its contents provide students with an awareness of the composites engineering process framework through course materials and practical applications through online discussions. Topics include engineering, manufacturing, maintenance, and certification of composite materials associated with civil aircraft structures. The course content is in accordance with FAA AC 20-107B (Composite Aircraft Structure).

This course was developed through the collaboration of Wichita State University, industry subject matter experts, and the Federal Aviation Administration. The course is taught online, includes all teaching materials, and features real-world discussions facilitated by those with subject matter expertise and FAA representatives. Depending on prior knowledge and experience, students will spend approximately ten hours per week reviewing materials, participating in online discussions and testing their knowledge.

After finishing a 1-week period of self-study of fundamental composites and successfully completing an examination, students proceed to more advanced topics through an on-line, interactive learning experience via Blackboard. Teaching methodology includes online discussions facilitated by subject matter experts, relevant documentation, and audio/visual aids.

## Course Objective

- Students will describe engineering principles for substantiating composite airframe structures during all stages of aircraft product certification.

## Who Should Attend?

- Professionals responsible for the engineering of composites
- Individuals having a general background in composites and/or engineering technology.
- Civil aviation regulatory authorities and industry designees who participate in the certification of composite structures.

## Prerequisite

Students will review summary reading material on basic composite technology during the first week of the online class, followed by an assessment to measure students understanding of prerequisite content. After successfully completing the online assessment, students are given access to the CSET course.

## Course Topics include:

- Composite Applications
- Material, Processing, and Fabrication Development
- Design Development
- Structural Substantiation
- Manufacturing and Maintenance Interface
- Additional Topics: Flutter, Crashworthiness, Fire Safety and Lightning Protection

## DATES

Online Course: March 9, 2020 - June 7, 2020

Optional Hands-on Lab: May 4-5, 2020

## FEES

Tuition is \$1,600.00 for the online course. The optional hands-on laboratory will be an additional fee. Registration is limited to 22 individuals and will be accepted on a first come first serve basis. Course materials are included with tuition. You may register and pay on-line at [www.wichita.edu/conferences/cset](http://www.wichita.edu/conferences/cset).

### Laboratory:

*(The Lab and Lab Fee associated with this course is separate and is offered as a badge for college credit.)*

The cost for the lab is \$755. The lab will be held on May 4-5, 2020, at the National Center for Aviation Training (NCAT) in Wichita, KS. Details about the lab course can be found at <http://badges.wichita.edu/node/229>.

This optional laboratory provides students with hands-on experiences on prepreg cutting, manual layup and bagging of simple laminated composite parts, non-destructive inspection and scarf repair. The hands-on lab is strongly recommended for individuals who attend CSET or CMfgT courses. Students can enroll in the lab course by completing the enrollment instructions at the following link <http://badges.wichita.edu/node/86>. Each student will need to complete the application for graduate badges.





### As space is limited, register quickly to reserve your spot!

If the class fills prior to registering, students are placed on a waiting list for possible future classes.

### Cancellations and Refunds:

All cancellations must be made in writing. A 15% administrative fee will be assessed on all cancellations (this includes purchase orders). There will be no refunds after February 24, 2020. WSU reserves the right to cancel the program due to lack of enrollment. In that event, WSU will refund any pre-paid course fees but will not be responsible for any incidental or consequential damages.

## WHAT WE'VE HEARD

-  *I wish I had this education years ago, as it has definitely reinforced the protocols that I have picked up along the way. For a new designer in the aerospace field, this would be a great tool to shorten the learning curve. (E.B., Stress Engineer)*
-  *I thought the structure of the class and the combination of presentations, exams, and forum discussions was outstanding for an online course. I thought it was very well implemented and would definitely consider a similar course in the future. (P.T., Stress Analyst (design, testing, and certification of CFRP horizontal stabilizer skins))*
-  *There's so much FAA and industry guidance on composites, that having it all distilled into a course like CSET allowed me to write a clear certification methodology in just a few weeks. (G.S., Consultant Structures DER and ODA Unit Member)*
-  *The instructors encouraged the participants' interaction by asking questions and did provide a lot of information from their experiences that is not included in the course contents. (L.S., Research and Development Engineer)*

# MEET THE INSTRUCTORS



## **Charles Seaton**

Charles Seaton has over 30 years of experience in aerospace businesses involving aircraft design, manufacturing, education and aircraft modification. He has led and consulted in global education initiatives which promote safe practices with composite materials in aerospace and other industries. He has taught and developed curricula with international composite experts and educators in the field of composite technology, repair and engineering for over ten years.



## **Christos Kassapoglou**

Christos Kassapoglou worked at Beech Aircraft (1984-1987) heading the analysis effort for the certification of the all-composite Starship I. He then joined the Structures Research group of Sikorsky Aircraft (1987-2001) where he worked on the development of analysis methods focusing on damage tolerance of composites and weight and cost optimization of composite airframe structures. Since 2001 he has been consulting with various US and European companies on design and analysis of composite structures and worked (until 2016) as an Associate Professor at Delft University of Technology in the Netherlands. In 2017 he joined Lockheed Martin. He has over 70 publications in refereed journals on composites analysis and design, cost-weight tradeoffs of composite structures, damage tolerance and fatigue of composites. Two books: (1) Design and Analysis of Composite Structures, 2nd Edition, Wiley, 2013, Modeling the Effect of Damage in Composite Structures, Wiley, 2015, and a book chapter, "Structural Design – Tradeoffs" in Encyclopedia of Aerospace Engineering, eds R. Blockley and W. Shyy, John Wiley: Chichester. 2012.

**Course development was supported by FAA and industry engineers, bringing decades of experience in both regulatory and engineering practice to the course development. In addition to the above instructors, FAA representatives will participate in the online discussions when aviation regulations, guidance or policy questions arise**

**Cindy Ashforth**, *Senior Technical Specialist for Composites, FAA Aircraft Certification Service, Policy and Innovation Division*

Ms. Ashforth has over 25 years' experience testing and certifying composite structures, as both a certification manager and composite materials specialist. As one of the FAA's subject matter experts for advanced composite materials, she provides technical advice on rule making activities, writes guidance documents, develops and delivers educational materials, and assists in certification projects and continued operational safety activities related to composite applications.

**Dr. Larry Ilcewicz**, *FAA Chief Scientific and Technical Advisor (CSTA) for Composite Materials*

Mr. Ilcewicz started work with the FAA in 1998. Since joining the FAA, he has supported many small airplane, rotorcraft, and transport aircraft certification programs. He has also worked on accident investigations and service problems involving composites. These experiences helped develop an international plan for composite safety and certification initiatives called the FAA Aviation Safety Composite Plan.



**Angie Kostopoulos**, *Aerospace Engineer, Composite Technical Specialist, FAA Policy and Innovation Division*

Ms. Kostopoulos has over 25 years' experience certifying Part 23 aircraft composite structures, as both a certification Program manager and composite Technical specialist. As one of the FAA's Composite Technical Specialist, she supports certification projects and continued operational safety activities related to composite structures for small aircraft/jets as well as rotorcraft. She also provides input and assists with the development of guidance and policy using her certification experience with the various composite Type certification projects and delivers educational materials.

**Allen Rauschendorfer**, *Technical Specialist-Composites, FAA Airframe Section*

Mr. Rauschendorfer has thirteen years with the FAA and is currently the FAA Composites Technical Specialist for the Seattle Aircraft Certification Office (SACO) addressing certification issues and continued operational safety (COS) concerns regarding composite materials for both Part 23 and Part 25 aircraft. He is FAA senior COS engineer for the Boeing 767 and 787 programs addressing all safety fleet concerns independent of materials. He came to the FAA with 22 years of airframe design and analysis experience for new military and commercial transport products.