

Composite Structural Engineering Technology (CSET) Course

Online Course: April 1, 2019 - June 28, 2019



In this course students will:

- Learn the framework for substantiation of composite aircraft structure. Major topics include:
 - Means of Compliance
 - Proof of Structure
 - Damage Tolerance
- Through on-line discussions, interface with expert structural engineers from industry and the FAA throughout the online class.
- Receive a certificate of completion upon successfully meeting course requirements



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Course Description

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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. A hands-on lab will be offered separately at future times. Completion of the lab is required to receive a CSET certificate.

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:

- Challenges of Composite Applications
- Design, Material and Fabrication Development
- Proof of Structure
- Quality Control of Composite Manufacturing Processes
- Maintenance Interface Issues
- Additional Topics (flutter, crashworthiness, fire safety, fuel tank issues, and lightning protection)

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

Laboratory:

The cost for the lab is \$755 and takes May 1-2, 2019 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>.

The hands-on-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>. Student will need to complete the application for graduate badges.





CSET Course Registration Fee:

Tuition is \$1,600.00 for the online course. The 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.

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 March 29, 2019. 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.

Quotes from past students concerning the course

-  *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)*

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

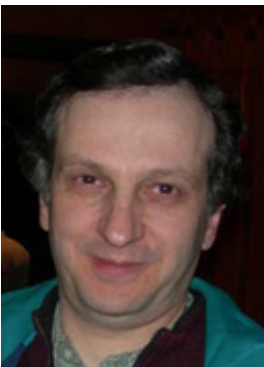
If the class fills prior to registering, students are placed on a waiting list for possible future classes.

ABOUT 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.

Mark Freisthler

Mark Freisthler is an aerospace engineer currently assigned to the Transport Airplane Directorate (TAD) standards staff, airframe, and cabin safety branch. Prior to his current assignment he worked in the Airframe Branch of the Seattle Aircraft Certification Office (SACO). Since joining the FAA in 2002, Mark has supported many transport airplane certification programs. He also represents the transport airplane directorate to a number of government/industry consortiums such as MMPDS and CMH-17. Mark's main experience is in the development of material design values for composite and metallic materials. **FAA Experience: 10 Years; Industry Experience: 21 Years**

Larry Ilcewicz

Dr. Larry Ilcewicz is the FAA Chief Scientific and Technical Advisor (CSTA) for Composite Materials. He started work with the FAA in 1998. Since joining the FAA, he 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 Larry develop an international plan for composite safety and certification initiatives. **FAA Experience: 15 Years; Industry Experience: 19 Years**