

# Composite Structural Engineering Technology (CSET) Course

Online Course: April 3 - July 2, 2017



Blackboard



## 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.
- Apply course principles in a hands-on laboratory to practice principles of engineering, manufacturing and maintenance of composite structures.
- Receive a certificate of completion upon successfully meeting course requirements



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# Course Description

## Course Description

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 subject matter experts 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. A 2-day hands-on lab is offered in Wichita, Kansas.

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)

## Dates:

Online Course: April 3, 2017 - July 2, 2017

A hands-on laboratory will be offered twice in 2017, with dates to be announced. Students may choose which laboratory session they attend.

**Lab Location:** National Center for Aviation Training (NCAT)  
4004 N Webb Rd. Wichita, KS 67226  
No parking permit is needed.

**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](http://www.wichita.edu/conferences).

**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 27, 2017. 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**

-  *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)*
-  *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)*
-  *The instructor 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 (Honeywell - China)*
-  *I often felt out of my depth in discussions, but the knowledge and input of those more experienced in my areas of weakness was one of the most valuable aspects of the course. On other topics, I realized I was the expert and others probably gained from my experiences. - M.A.*

**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 aircraft design, manufacturing, education and aircraft modification. Charles applies his extensive aerospace and education development experiences to a wide range of technical and business curricula. He leads and consults 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, including being a project leader in the FAA's education initiatives. Charles has been an active member and chairman of the Commercial Aircraft Composite Repair Committee training task force which promotes standard work practices.



### **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. Current, he is an Associate Professor at Delft University of Technology in The Netherlands. He has over 50 publications in refereed journals on composites analysis and design, cost-weight tradeoffs of composite structures, damage tolerance and fatigue of composites. One book: Design and Analysis of Composite Structures, Wiley, 2010, 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.**

### **Rusty Jones**

Rusty Jones is the Senior Technical Specialist NDI/Composites Maintenance in the FAA's Aircraft Certification Service, AIR-100, Design, Manufacturing and Airworthiness Division. He has an extensive background in maintenance programs development and operational issues. His primary interest is in the field of Nondestructive Inspection (NDI) and composites. His service with the FAA has included Aviation Safety Inspector (ASI), National Resource Specialist (NRS) for NDI, and Branch Manager for Special Projects in the Aircraft Maintenance Division.. In addition to his FAA experience, he has an operational background from having worked for over 16 years at various airlines. During his time in the industry, he held jobs including mechanic/inspector, nondestructive technician and NDI manager.

FAA Experience: 20 Years

Industry Experience: 16 Years

### **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

### **Allen Rauschendorfer**

Allen Rauschendorfer is the FAA Composites Technical Specialist for the Seattle Aircraft Certification Office (SACO). He is currently responsible for the Continued Operational Safety (COS) of the Boeing 787 and 767 programs. In his previous five years of working at SACO, he was responsible for the airframe certification on the Boeing 787-8 program. Allen's experience in airframe design for new aerospace products for both military (B-2, A-6 Rewing, F-22, A-12, P-8A, Airborne Laser) and commercial (757-300, 777-100, 737-600/700/800) programs have given him an understanding of real world design and manufacturing of composite material applications as well as the certification challenges facing composites usage on commercial aerospace products.

FAA Experience: 5 Years

Industry Experience: 22 Years

# Composite Structural Engineering Technology Course Registration Form

Wichita State University – Office of University Conferences, 1845 Fairmount, Campus Box 136,  
Wichita, KS 67260-0136

316-978-6493; Fax: 316-978-3064; Web: <http://www.wichita.edu/conferences> E-mail:  
[conference.office@wichita.edu](mailto:conference.office@wichita.edu)

Company Name \_\_\_\_\_ Company Phone \_\_\_\_\_

Mailing Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Registration/Billing Contact \_\_\_\_\_ E-mail: \_\_\_\_\_

Participant Names	Phone (day)	Email address
_____	_____	_____
_____	_____	_____
_____	_____	_____

Registration Fee: \$1,600 Total Due: \_\_\_\_\_

### Payment Method:

Check     Purchase Order  
 Visa     Mastercard     American Express     Discover

CC#: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

Security Code: \_\_\_\_\_ (3 digit code on back of card or 4 digits on front of American Express)

Name as printed on the card: \_\_\_\_\_

Signature: \_\_\_\_\_

### *Accessibility:*

Wichita State University is committed to making programs accessible to persons with disabilities. If you wish to volunteer information regarding any special assistance you may need, please notify the Office for Workforce, Professional & Community Education at: (316) 978-6493.

**Notice of Nondiscrimination:** Wichita State University does not discriminate in its employment practices, educational programs or activities on the basis of age, color, disability, gender, gender expression, gender identity, genetic information, marital status, national origin, political affiliation, pregnancy, race, religion, sex, sexual orientation, or status as a veteran. Retaliation against an individual filing or cooperating in a complaint process is also prohibited. Sexual misconduct, relationship violence and stalking are forms of sex discrimination and are prohibited under Title IX of the Education Amendments Act of 1972. Complaints or concerns related to alleged discrimination may be directed to the Director of Equal Opportunity or the Title IX Coordinator, Wichita State University, 1845 Fairmount, Wichita KS 67260-0138; telephone (316) 978-3187.

### *How to Register:*

**On-line at:** <http://www.wichita.edu/conferences>

**By Fax:** 316-978-3064

**Mail:** WSU – Office of University Conferences  
1845 Fairmount, Campus Box 136  
Wichita, KS 67260-0136

### **Questions?**

Contact WSU Conferences at 316-978-6493