

University of Southern California  
Aviation Safety and Security Program  
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2020-  
2021

<https://aviationsafety.usc.edu>

## *Aviation Safety + Security Program*

**NEW ACCIDENT INVESTIGATION LAB**

**NEW SAFETY PERFORMANCE INDICATORS (SPI) COURSE**

**DATA FOR SAFETY MANAGEMENT (DATA)**

**SMS FOR DRONES (RPSM)**

**SEVEN LAB COURSES**

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## MESSAGE FROM THE DEAN

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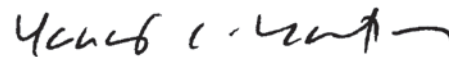
While I traditionally prefer to look forward to future opportunities, it is impossible to go forward without reflecting upon the B737MAX situation. The necessity for excellence in engineering comes through as a dominant and controlling lesson. We all recognize that no aviation accident is the result of a single hazard. Indeed, most are the result of several hazards coming together at the same time in the same place and under difficult circumstances. But, looking ahead each one of us must recognize that engineering must be a profession that has integrity at its core.

System Safety is the engineering discipline that identifies and quantifies predicted operational risk during the development of a system – any system. System Safety evolved from the needs of the Aerospace industry in the 1960's with the first meeting of the System Safety Society on our USC campus in 1963. It is perhaps time to refocus on this important and essential process.

The Viterbi School of Engineering has adopted the Grand Challenges of the National Academy of Engineering to inform our research. These goals include Advanced Personalized Learning, Engineer Better Medicines, Access to Clean Water and the Prevention of Nuclear Terror. We as engineers are faced with a full range of challenges; but we as the Viterbi School of Engineering must face them as opportunities to make the world around us a better place.

These are global challenges and the global nature of our Aviation Safety and Security Program is underscored by the student populations that attend our courses. Indeed, as world conditions evolve new countries discover our program and send their aviation safety professionals to our courses. Students from Hungary, the Netherlands, Ireland, Singapore, Belgium, Denmark, Taiwan, South Korea, and Mexico join with others in our LAX campus classrooms. This is fitting and in agreement with the heritage of our program which began as a mutual program with the USAF in 1952 and expanded to NATO countries in 1959.

USC strives to be the university of choice for future leaders from all over the world. The USC Aviation Safety and Security Program has made strong contributions to this effort, and will do so in years to come.



*Yannis C. Yortsos, Dean  
USC Viterbi School of Engineering*

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## USC AVIATION SAFETY AND SECURITY PROGRAM

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In 1952, USC established the first Aviation Safety Program at a major research university. Since then the program has gained a highly respected reputation with more than 27,000 aviation professionals from over 70 nations having completed its courses.

The program was originally developed by a project team of faculty from three disciplinary areas: engineering, management and psychology. The courses they developed integrated appropriate subject matter from these areas into a comprehensive systems approach to safety.

There are 27 different courses available, with approximately 55 total sessions scheduled each year. Courses are scheduled consecutively to permit out-of-state and international students to complete a sequence of courses or an entire certificate program in one stay. In addition to the scheduled courses, contract courses are conducted at locations worldwide.

The Certificate Program in Aviation Safety and Security, which requires an individual to complete a series of courses, has been completed by over 2450 students.

A brief list of organizations with employees who have attended includes:

International air carriers recognized for their outstanding safety records including Air New Zealand, British Airways, Cathay Pacific Airways, Emirates, EVA Air, KLM Royal Dutch Airlines, Lufthansa, Qantas, SAS, Singapore Airlines, Swiss Airlines, Virgin Atlantic, Virgin Australia;

U.S. government agencies managing air safety and accident investigations and recommendations — the FAA and the National Transportation Safety Board, US Customs and Border Protection, the FBI and the equivalent agencies of Canada, France, Great Britain, Italy, Japan, New Zealand, Nigeria, Republic of Korea, Singapore, South Africa, Taiwan, Trinidad & Tobago, and Brazil;

The U.S. Army, Air Force, Navy, Marines and Coast Guard;

All U.S. major air carriers and aircraft manufacturers;

Other international air carriers including Air Astana, Air Canada, Alitalia, Copa Airlines, Egypt Air, El-Al Israel Airlines, Etihad Airways, Kenya Airways, Royal Jordanian Airlines, and Saudi Arabian Airlines;

International aircraft manufacturers including Airbus, Airbus Helicopters, Embraer, Bombardier, and Mitsubishi;

International military organizations including the Canadian Defense Forces, Chilean Air Force, Colombian Air Force, Ecuadorian Air Force, Irish Air Corps, Italian Air Force, Ministry of Defence Hungary, Navy of Mexico, Republic of Korea Air Force, Republic of Singapore Air Force, Royal Air Force, Royal Danish Air Force, and the Royal Netherlands Air Force;

Aviation elements of the United Nations, International Civil Aviation Organization (ICAO) and the World Food Program.

Continuing Education Units (CEU's) are available upon request. One CEU is awarded for every 10 hours of instruction.

More information can be accessed on our website, <https://aviationsafety.usc.edu>.

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## AVIATION SAFETY AND SECURITY CERTIFICATE PROGRAM

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Individual courses are designed to provide the student with expertise in a particular subject area. While each course is constructed as a whole and taught independently of the others, those interested in preparing for a full-time career in aviation safety should consider a program of courses that provides broad knowledge. We award the University of Southern California's *USC Aviation Safety and Security Certificate* to those successfully completing the required program. It certifies completion of training in several multidisciplinary areas including Aviation Safety Management Systems, Accident Investigation, and Human Factors.

Students satisfying the four categories below will be awarded the *USC Aviation Safety and Security Certificate*. There is a 7-year time limit for completion of the certificate program.

1. One of the following:
  - Aviation Safety Management Systems (ASMS)
  - Safety Management for Aviation Maintenance (MAINT)
  - Safety Management for Remotely Piloted Aircraft (RPSM)
  - System Safety (SSC)
2. One of the following:
  - Aircraft Accident Investigation (AAI)
  - Helicopter Accident Investigation (HAI)
  - Gas Turbine Engine Accident Investigation (GTAI)
3. One of the following:
  - Human Factors in Aviation Safety (HFH)
  - Human Factors in Aviation Maintenance (HFMX)
- 4a. Two of the following:
  - Photography for Aircraft Accident Investigation (PHOTO)
  - Threat and Error Management (TEM)
  - SMS for Ground Operation Safety (SMS-RAMP)
  - SMS for Airport Construction Operations (SMS-ACO)
  - SMS for Managers (SMS-MGR)
  - Safety Performance Indicators (SPI)

Or
- 4b. One of the following:
  - Aviation Security Program Management (AVSEC)
  - Software Safety (SFT)
  - Advanced Software Safety (ADVSFT)
  - Accident/Incident Response Preparedness (AIP)
  - Incident Investigation/Analysis (IIA)
  - Data for Aviation Safety Management (DATA)
  - Aviation Law & Aviation Dispute Resolution (LEGAL)
  - One additional management course from #1
  - One additional accident investigation course from #2

## SYSTEM SAFETY CERTIFICATE PROGRAM

The USC Aviation Safety and Security Program also offers a certificate program in System Safety. This certificate is designed to address the needs of engineers and project managers with responsibilities for system safety. The principle method of system safety analysis and the extension of this program plan are taught in the flagship class of the certificate program — System Safety. The emphasis is on complex, high technology programs.

Today's systems are highly dependent upon software to operate and monitor. Software requires special attention in system planning, architecture, design and test. The Software Safety Course teaches software design principles which are fault tolerant and acceptably safe.

System safety analysis of engineered systems must often deal with the possibility of human error leading to adverse conditions. Therefore, human error probability evaluation is an essential element in system safety analysis and a fundamental part of the curriculum. The three courses: System Safety (SSC), Software Safety (SFT), and Human Error Analysis for System Safety (HEASS) form the three core courses of the System Safety Certificate Program. Additionally, in order to complete the requirements of the System Safety Certificate, two short elective courses are necessary.

Students have 7 years from the start of their first course to complete the System Safety Program certificate requirements. The program certificate can be completed with 4 or 5 courses, depending on the courses chosen to attend. All courses are Monday through Friday, 8:00 AM to 4:00 PM, unless stated otherwise. A course listed with a half-day ends at noon on the last day of the course.

To complete the program certificate individuals must meet the following requirements:

1. Complete each of the following 3 required courses:

System Safety (SSC)	9.5 day course
Software Safety (SFT)	4 day course
Human Error Analysis (HEASS)	2 day course

- 2A. Complete two of the following courses:

Damage Assessment for System Safety (DASS)	3 day course
Hazards: Effects and Control Strategies (HAZSS)	2 day course
Mathematics for System Safety Analysis (MATH)	3 day course

Or

- 2B. One of the following courses:

Advanced System Safety (ADVSS)	4.5 day course
Advanced Software Safety (ADVSFT)	4 day

## AVIATION SAFETY AND SECURITY CERTIFICATE PROGRAM SERIES

For individuals interested in completing the Aviation Safety and Security Certificate Program entirely in one continuous time frame, we are offering the following series:

CERTIFICATE SERIES	COURSE NO.	DATES
<b>Series 21A</b>		
ASMS	21-1	14 – 25 Sep 2020
AAI	21-1	28 Sep – 09 Oct 2020
HFH	21-2	12 – 16 Oct 2020
GTAI	21-1	19 – 23 Oct 2020
<b>Series 21B</b>		
GTAI	21-1	19 – 23 Oct 2020
HFMX	21-1	26 – 30 Oct 2020
HAI	21-1	02 – 06 Nov 2020
ASMS	21-2	09 – 20 Nov 2020
<b>Series 21C</b>		
SSC	21-1	12 – 23 Oct 2020
HFMX	21-1	26 – 30 Oct 2020
HAI	21-1	02 – 06 Nov 2020
ASMS	21-2	09 – 20 Nov 2020



**Series 21D**

DATA	21-1	05 – 09 Oct 2020
HFH	21-2	12 – 16 Oct 2020
GTAI	21-1	19 – 23 Oct 2020
RPSM	21-1	26 – 30 Oct 2020

**Series 21E**

AAI	21-1	28 Sep – 09 Oct 2020
HFH	21-2	12 – 16 Oct 2020
GTAI	21-1	19 – 23 Oct 2020
RPSM	21-1	26 – 30 Oct 2020

**Series 21F**

DATA	21-1	05 – 09 Oct 2020
SSC	21-1	12 – 23 Oct 2020
HFMX	21-1	26 – 30 Oct 2020
HAI	21-1	02 – 06 Nov 2020

**Series 21G**

AAI	21-1	28 Sep – 09 Oct 2020
SSC	21-1	12 – 23 Oct 2020
HFMX	21-1	26 – 30 Oct 2020
HAI	21-1	02 – 06 Nov 2020

**Series 21H**

SSC	21-1	12 – 23 Oct 2020
HFMX	21-1	26 – 30 Oct 2020
HAI	21-1	02 – 06 Nov 2020
ASMS	21-2	09 – 20 Nov 2020

**Series 21I**

ASMS	21-3	22 Feb – 05 Mar 2021
HFH	21-4	08 – 12 Mar 2021
HAI	21-2	15 – 19 Mar 2021
DATA	21-2	22 – 26 Mar 2021

**Series 21J**

ASMS	21-3	22 Feb – 05 Mar 2021
HFMX	21-2	08 – 12 Mar 2021
HAI	21-2	15 – 19 Mar 2021
DATA	21-2	22 – 26 Mar 2021

**Series 21K**

ASMS	21-3	22 Feb – 05 Mar 2021
HFH	21-4	08 – 12 Mar 2021
HAI	21-2	15 – 19 Mar 2021
SSC	21-2	22 Mar – 02 Apr 2021

**Series 21L**

ASMS	21-3	22 Feb – 05 Mar 2021
HFMX	21-2	08 – 12 Mar 2021
HAI	21-2	15 – 19 Mar 2021
SSC	21-2	22 Mar – 02 Apr 2021

Each course in a certificate program series must be registered for individually. You may list up to 6 courses on one registration form.

The USC Aviation Safety and Security Certificate Program has been accepted by the FAA Aviation Maintenance Technical Award Program to assist in qualifying for awards in that program. Portions of the training requirements for each of the award levels can be satisfied using training received in this program. Reference [faa.gov/regulations\\_policies/advisory\\_circulars/index.cfm/go/document.information/documentid/1029857](http://faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentid/1029857) for further information. CEU's earned while attending classes in the USC Aviation Safety and Security Program may be used towards receiving the FAA's highest award, the William (Bill) O'Brien Aviation Maintenance Award, given to eligible technicians and their employers [please see FAA Advisory Circular (AC) 65-25F for eligibility requirements].

Several of the courses are credited toward the National Business Aviation Association's (NBAA) Certified Aviation Manager (CAM) Program and several courses accrue credit for the FlightSafety International's Master Technician Program. Please see Registrar for additional details.

In addition, the International Federation of Air Line Pilots' Association (IFALPA) recognizes recipients of the USC Aviation Safety Certificate as experts in Aviation Safety.

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## CONTRACT COURSES

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Contract courses are courses from the USC Aviation Safety and Security Program that are offered at locations other than our Los Angeles classroom facilities. Any course in the catalog may be offered as a contract course. Courses may be conducted at international locations or at a location within the United States. Frequently, organizations striving to provide aviation safety or systems safety education for numerous members of their organization choose to arrange for a contract course at their own facility.

In the recent past, numerous contract courses have been provided at international locations in Asia, Europe, Oceania, Africa, and the Caribbean. Typically, civil aviation authorities, airlines, and other government organizations require contract courses when they have a large number of students interested in education.

Organizations such as Air New Zealand, CAA of South Africa, CAA of Trinidad and Tobago, Executive Jet, ConocoPhillips, Federal Aviation Administration, FedEx, Fiji Airways, Google, Gulf Stream, Hawaii Department of Transportation, IFALPA, Korean Airlines, NASA, Republic of Singapore Air Force, U.S. Army, U.S. Navy, Verizon and Walmart Aviation have arranged contract courses.

The contract course can provide an organization with an economical vehicle for providing aviation safety or system safety education to a large number of employees within a relatively short amount of time as well as the ability to customize a course for an organization's particular needs. Inquiries regarding contract courses should be made to the USC Aviation Safety and Security Program Director, or the Contract Course Coordinator at [hinaba@usc.edu](mailto:hinaba@usc.edu).

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## AVIATION SAFETY MANAGEMENT SYSTEMS (ASMS)

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A Safety Management System (SMS) is now a requirement for international commercial aircraft operators, international airports, and air traffic services. The standards and implementing procedures for SMS have been established by the International Civil Aviation Organization (ICAO). All 191 countries that are members of ICAO have established or are establishing regulatory requirements for the implementation of SMS. This course teaches how organizations can establish a SMS within the context of their current safety system that meets the basic international standards of ICAO. The SMS Framework serves as a central foundation for this course.

SMS is a safety system by which an organization takes a more active role in the identification, analysis and mitigation of safety issues that occur in the normal operation of their organization. SMS requires that organizational management take responsibility for the company's safety program. The SMS approach requires the safety/quality team be educated in their duties and responsibilities. This course will provide you with the essential skills needed to manage an organizational Safety Management System (SMS). The attendee will be able to manage a Safety Management System that includes risk management, audits, data collection, analysis, and incident investigations.

This course is designed for the individual responsible for planning or directing an aviation Safety Management System program. Fundamentals in systems organization and structure provide the individual with the essential skills and methodology needed to plan and manage an effective program. Emphasis is placed on understanding the principles of risk management, identifying program development strategies, audits and applying the knowledge toward effective management systems and interoperability with Quality Assurance.

**Objectives:** To provide the individual with the skills and practical methods to plan, manage and maintain an effective Aviation Safety Management System (SMS).

**Who Should Attend:** Individuals responsible for planning, directing or managing an aviation safety management program and supervisors who are required to supervise an accident prevention/risk management program.



This includes airline, commuter, corporate, fixed base operator, government, insurance, hospital emergency medical service, law enforcement and airport management.

**Course Outline**

1. Safety Management Systems (SMS)
  - Accident Prevention Concepts/Methods
  - Safety Systems
  - Safety Risk Management
  - The Failure Modes and Effects Analysis (FMEA) Process
  - Human Factors
  - Root Cause Analysis
  - International Procedures
  - Interaction with Quality Assurance
  - Education and Training
  - Corporate Safety Culture
  - Motivating Safe Behavior
  - Role of Management
  - Safety Climates/Management Styles
  - Cost of Accidents
  - Risk Identification
  - Incident Investigation
  - Change Management Process
  - Risk Management and Risk Assessment
  - Report Writing
  - Airfield Safety
  - Accident Response Planning
  - Audits
  - Safety Analysis
  - Aviation Safety Advisor Duties
  - SMS Framework
2. Communication Skills
  - The Importance of Communication in Aviation Safety
  - A Matrix Approach to Communication in Aviation Safety
  - Perception
  - Meaning/Language/Jargon
  - Information Overload
  - Effective Safety Meetings
  - Listening

3. Medical Issues
  - Fatigue Risk Management Systems
  - Sleep and Fatigue
  - Stress
4. Ramp/Maintenance Safety
5. Legal Aspects
  - ICAO Annexes 6, 14, 19
  - ICAO Doc. 9859
  - FAA 14 CFR 5
6. Practical Applications/Case Study

**CEU: 6.7**

**Course Duration: 9.5 Days**

Course No.	Dates	Tuition
ASMS 21-1	14 – 25 Sep 2020	\$3750
ASMS 21-2	09 – 20 Nov 2020	\$3750
ASMS 21-3	22 Feb – 07 Mar 2021	\$3750
ASMS 21-4	07 – 18 Jun 2021	\$3750
ASMS 22-1	13 – 24 Sep 2021	TBA
ASMS 22-2	08 – 19 Nov 2021	TBA

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**AIRCRAFT ACCIDENT INVESTIGATION (AAI)**

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The course is designed for individuals who have limited investigation experience. All aspects of the investigation process are addressed, starting with preparation for the investigation through writing the final report. It covers National Transportation Safety Board and International Civil Aviation Organization (ICAO) procedures. Investigative techniques are examined with emphasis on fixed wing investigation. Data collection, wreckage reconstruction and cause analysis are discussed in the classroom and applied in the lab.

The USC Aircraft Accident Investigation lab serves as the location for practical exercises. Thirteen aircraft wreckages form the basis of these

investigative exercises. The crash laboratory gives the student an opportunity to learn the observation and documentation skills required of accident investigators. The wreckage is examined and reviewed with investigators who have extensive actual real-world investigation experience. Examination techniques and methods are demonstrated along with participative group discussions of actual wreckage examination, reviews of witness interview information, and investigation group personal dynamics discussions.

**Objectives:** To provide concepts and practical techniques on aircraft investigation methodology, and prepare an individual to participate in an aircraft accident investigation.

**Who Should Attend:** Persons associated with aircraft accident investigation including manufacturers, operators, associations, insurers, air carriers, government agencies, law enforcement and military.

**Course Outline**

1. Investigations
  - Introduction and History
  - Authority and Theory
  - Principles of Investigation
  - Initial Actions
  - Site Safety
  - On-Scene Investigation Procedures
  - Investigation of Aircraft Fires
  - Reciprocating Engines and Propellers
  - Gas Turbine Engines
  - Systems Investigation
  - In-flight Breakup and Midair Collisions
  - Technical Assistance
  - Analysis and Report Writing
  - Flight Data Recorders
  - Cockpit Voice Recorders
2. Technology
  - Types of Material Failures
  - Metal and Composite Materials
  - Identifying Failures in the Field
  - Understanding Aircraft Stability
  - Aerodynamics – Accident Cause or Contributor

3. Human and Biomedical Factors
  - Human Factors
  - Casualty Identification
  - Aeromedical Role in Investigation
4. Accident Investigation Laboratory
  - (conducted in a separate facility with actual wreckage)
  - Wreckage Observation/Familiarization
  - Wreckage Examination/Documentation
  - Investigation Organization at Accident Site
  - Accident Site Hazards and Safety
  - Investigative Group Interactions

**CEU:** 6.7

**Course Duration:** 9.5 Days

Course No.	Dates	Tuition
AAI 21-1	28 Sep – 09 Oct 2020	\$3750
AAI 21-2	07 – 18 Dec 2020	\$3750
AAI 21-3	25 Jan – 05 Feb 2021	\$3750
AAI 21-4	26 Apr – 07 May 2021	\$3750
AAI 22-1	27 Sep – 08 Oct 2021	TBA
AAI 22-2	06 – 17 Dec 2021	TBA

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**HELICOPTER ACCIDENT INVESTIGATION (HAI)**

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The course examines the investigation of helicopter accidents to include processes used to determine the cause. The course includes interactive lecture, various case studies, examination of component wreckage in the classroom and helicopter wreckage examination in a laboratory. The course includes examination of helicopter rotor systems, controls, performance variables, flight hazards and material characteristics involved in helicopter operations and accidents. Although Aircraft Accident Investigation (AAI) is not a prerequisite, it is assumed that the attendee has either completed AAI or has some previous experience in aircraft accident investigation.

**Objectives:** To provide concepts, practical techniques and methodologies essential to rotary wing aircraft accident investigation.

**Who Should Attend:** Persons associated with rotary wing accident investigation including manufacturers, operators, associations, insurers, law enforcement, military and governmental agencies.

**Course Outline**

1. Accident Investigation & Analysis:
  - Assessing Indicators of Accident Causation
  - Data Collection
  - Investigative Tools
  - Risk and the Operating Environment
  - Pre-Investigative Planning
  - Operational Procedures
  - Technical Data
  - Accident Scene Documentation
  - Fluid Sample Analysis
  - Inventory of Aircraft Wreckage
  - Diagrams: Plan, Profile, Polar, Base Line, Witness, Photography
  - Impact Force Determination
  - Rotor System Examination
  - Fire Investigation: Source and Temperature
  - Composite Materials Overview
  - Powerplant Investigation: Turbine and Reciprocating Engines
  - Instrument Examination
  - Maintenance Record Evaluation
  - Reviewing Pilot Records
  - Human Factors and Witness Interview
  - Crashworthiness
  - Meteorological Investigation
  - Communications
  - Various Case Studies
2. Helicopter Fundamentals and Material Factors
  - Material Failure Analysis
  - Rotor System Characteristics
  - Hover and Low Speed Operations
  - Tail Rotor/Anti-Torque Performance Variables

- Downwind Operations
- Forward Flight Operations
- Mast Bumping
- Height/Velocity Variables
- Dynamic Stall
- Compressibility Effects
- Autorotation Variables
- Vortex Ring State
- Dynamic Rollover
- Ground Resonance
- Air Resonance
- Rotor Divergence
- Energy Attenuation Systems/Crashworthiness

**CEU:** 3.2

**Course Duration:** 4.5 Days

Course No.	Dates	Tuition
HAI 21-1	02 – 06 Nov 2020	\$2650
HAI 21-2	15 – 19 Mar 2021	\$2650
HAI 22-1	01 – 05 Nov 2021	TBA

**GAS TURBINE ENGINE ACCIDENT INVESTIGATION (GTAI)**

This specialized accident investigation course is directed to fixed wing turbojet and turboprop as well as turbine powered rotary wing aircraft. The course examines specific turbine engine investigation methods and provides technical information in the related area of material factors and metallurgical failure investigation. This is a fundamental accident investigation course. Individuals with many years of engine investigations may find this course too basic. It is assumed that the attendee has a basic understanding of jet engines.

**Objectives:** To provide the participant with the basic skills and knowledge to effectively examine the involvement of a turbine engine in an aircraft accident.

**Who Should Attend:** Individuals with responsibility for the post-accident examination of gas turbine engines and individuals responsible for integration of engine information into the total accident investigation.

**Course Outline**

- 1. Aviation Gas Turbine Engine Accident Investigation
  - Types of Gas Turbine Engines
  - Mounting of Turbine Engines
  - Major Components
  - Controls and Accessories
  - Related and Interfacing Aircraft Components
  - Engine Operating Characteristics
  - Potential In-Flight Engine Occurrences
  - Role of the Investigator
  - Best Practices in Investigations
  - Documentation of Physical Evidence
  - Investigation of Incidents
  - Investigation at the Accident Site
  - Engine Disassembly Investigation
  - Engine Operation Speed at Terrain Impact
  - Engine Uncontained Components
  - Engine Fire
  - Documentation
- 2. Material Factors
  - Investigation Procedures
  - Basic Metallurgy of Gas Turbine Materials
  - Failure Analysis – Fundamentals and Mechanical Factors
  - Failure Analysis – Fracture Mechanisms
  - Engine Component Investigation Examples
- 3. Case Study

CEU: 3.2

**Course Duration:** 4.5 Days

Course No.	Dates	Tuition
GTAI 21-1	19 – 23 Oct 2020	\$2650
GTAI 21-2	10 – 14 May 2021	\$2650
GTAI 22-1	25 – 29 Oct 2021	TBA

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**HUMAN FACTORS IN AVIATION SAFETY (HFH)**

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Humans design, build, operate and maintain the aviation system. Consequently, data shows that the majority of aviation accidents and incidents have roots in human factors. With this realization comes the conclusion that quality human factors training is effective in improving safety. This course presents human factors information in a manner that can be readily understood and applied by aviation practitioners. Emphasis is placed on identifying the causes of human error, predicting how human error can affect performance, and applying countermeasures to reduce or eliminate its effects. The course content follows the subjects recommended in FAA Advisory Circular 120-51E. The course also addresses some of the topics recommended in the International Civil Aviation Organization’s Human Factors Digest *Training Operational Personnel in Human Factors*. The emphasis is from the pilot’s perspective, but is applicable to all phases of aviation operations. The course relies heavily on participation, case studies, demonstrations, self-assessment and practical exercises.

**Objectives:** To provide a theoretical and practical knowledge of the application of human factors principles and techniques in aviation. To provide knowledge about human performance issues, including why we make errors and violate procedures. To provide strategies for individuals, leaders, and organizations that can be used to prevent errors/violations. To clarify the relationship between human factors, risk management, and Safety Management Systems.

**Who Should Attend:** This course has been carefully designed to appeal to a wide-spectrum of professionals actively involved in aircraft operations. There is special emphasis for safety managers, training, flight department and maintenance managers and supervisors, pilots, air traffic controllers, dispatchers and schedulers.

## Course Outline

1. Overview of Human Factors and Recent Advances
  - Human Error
  - Systems Approach to Aviation Safety Improvements
  - Cases of Aircraft Accidents Due to Human Error
2. Introduction to Human Error Accident Reduction Training
  - History of Aviation Human Factors
  - Reason Model
  - Human Factors in Automation
  - Corporate Culture
  - Engineering a Safety Culture
  - Threat and Error Management
  - Fatigue and Stress Management
  - Communications
  - Workload Management
  - Monitoring and Challenging
  - Situational Awareness
  - Norms
  - Decision-Making
  - Leadership
  - Information Processing
  - Case Studies
  - Build an Accident

CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
HFH 21-1	24 – 28 Aug 2020	\$2650
HFH 21-2	12 – 16 Oct 2020	\$2650
HFH 21-3	11 – 15 Jan 2021	\$2650
HFH 21-4	08 – 12 Mar 2021	\$2650
HFH 21-5	21 – 25 Jun 2021	\$2650
HFH 22-1	23 – 27 Aug 2021	TBA
HFH 22-2	11 – 15 Oct 2021	TBA

## HUMAN FACTORS IN AVIATION MAINTENANCE (HFMX)

This course is designed to provide knowledge and understanding of human factors in the realm of aviation safety with a focus on the role of the maintainer. It presents human factors issues as conditions/hazards that must be managed. Specific issues such as fatigue management, deviations for approved procedure, situation awareness and the Dirty Dozen are presented. Data collection methodologies such as MEDA and LOSA are examined as viable methods of safety information and as hazard identification tools in an organization's SMS. This course satisfies the Human Factors Course requirement for the USC Safety & Security Certificate.

**Objectives:** To create a comprehensive understanding of the factors affecting an individual's performance in aviation maintenance. To understand how the management of human factors play a central role in an organization's safety program.

**Who Should Attend:** This course is designed for supervisors, managers and staff officers who have responsibility for the oversight of aviation maintenance.

### Course Outline

1. History of HF
2. ICAO / EASA / FAA HF Requirements
3. Error Theory
4. Individual HF Performance Issues
  - Dirty Dozen
5. HF and Risk Management
  - Situational Awareness
  - Hazard Recognition
  - Risk Assessment Development
  - Risk Management (Matrix development)
6. HF specific industry problem areas
  - Human Factors Justification / Cost Benefits
  - Fatigue Management
  - Turnover Briefings
  - Failure to follow procedures / Deviations from proper maintenance



- 7. Communication
- 8. SMS overview
- 9. Pillars of SMS Program
- 10. Safety Policy Development
  - Risk Management
  - Safety Assurance / Monitoring / Data
  - Safety Promotion / Culture
- 11. Importance of Data Collection
  - Recognition of hazards for data collection
  - Methods – LOSA(M)(R)
  - MEDA brief
  - Importance for future design implementations
- 12. HF and Leadership
- 13. How leadership affects individual performance
  - Communication traits
  - Communication Conflicts
  - Stress, Pressure, and Teamwork traits
  - Individualism versus organization performance
  - How leadership affects culture – organizational performance
  - Leadership Styles & Conflicts
  - Decision Making Traits
  - Leadership and Safety Culture
  - Case Study

**Course Duration:** 4.5 Days

**CEU:** 3.2

Course No.	Dates	Tuition
HFMX 21-1	26 – 30 Oct 2020	\$2650
HFMX 21-2	18 – 12 Mar 2021	\$2650
HFMX 22-1	08 – 12 Nov 2021	TBA

## **SAFETY MANAGEMENT FOR AVIATION MAINTENANCE (MAINT)**

This course provides supervisors with aviation safety principles and practices needed to manage the problems associated with aircraft maintenance operations. In addition, it prepares attendees to assume safety responsibilities in their areas of operation. It does not teach aircraft maintenance and assumes the attendee has a maintenance background.

**Objectives:** To provide the individual with maintenance safety principles and guidelines for the development of effective maintenance safety programs.

**Who Should Attend:** Aircraft maintenance supervisors at all levels.

### **Course Outline**

1. SMS for Aviation Maintenance
  - Role of Management and Leadership
  - Safety Risk Management
  - Safety Assurance
  - Safety Promotion for Maintenance Technicians
  - The Failure Modes and Effects Analysis (FMEA) Process
  - Major Problems in Prevention
    - Prediction
    - Communication
    - Influencing Management
  - Safety Program Organization
    - Overall Responsibility
    - Organization
  - Motivating Safe Behavior
  - Safety Climates/Management Styles
  - Time Management
  - Safety Meetings/Committees
    - Administrative Procedures
  - Reporting Systems
  - Education and Training
    - New Mechanics/Safety Personnel
  - Accident Response Planning

Inspections/Audits/Surveys  
 Purpose  
 Self-Inspections  
 Compliance  
 Management  
 Contractor Provided Services

2. Flight Line Safety
3. Aircraft Maintenance Safety
4. ICAO Annex 19 Safety Management  
 Safety Management Manual Doc 9859

CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
MAINT 21-1	31 Aug – 04 Sep 2020	\$2650
MAINT 21-2	04 – 08 Jan 2021	\$2650
MAINT 22-1	23 – 27 Aug 2021	TBA

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### **SAFETY MANAGEMENT SYSTEMS FOR REMOTELY PILOTED AIRCRAFT (RPSM)**

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This Safety Management for Remotely Piloted Aircraft (RPSM) course is designed to apply the proven safety procedures of SMS to the operation of UAV's/RPA's. Experts from the fields of RPA Human Factors, RPA Safety Management Systems, and RPA Piloting introduce students to the theory and application unique to unmanned aircraft. By addressing the characteristics that differ between manned and unmanned air vehicles, the course applies the latest approaches to accident investigation and Safety Management. Students come away with a working knowledge of the safety field pertaining to Remotely Piloted Aircraft which they can apply to their own organization's operations and future planning.

**Objectives:** To provide the individual with the skills and practical knowledge to plan, manage and maintain an effective Safety Management Strategy in the operation of Remotely Piloted Aircraft in a variety of environments.

**Who Should Attend:** Individuals responsible for planning, directing or managing an aviation safety program and supervisors who are required to supervise an accident prevention/risk management program that may work with or operate Remotely Piloted Aircraft. This includes all classifications and sizes of Unmanned Systems throughout the world — military, civilian, and public-use.

#### **Course Outline**

1. Human Machine Interface Theory and Problems
  - Crew Communication Conditions & Technological Implications to Communications
  - How Maintenance Responsibilities differ between Manned and Unmanned aviation
  - Understanding the Unique Characteristics with RPA Operational Environments
  - Automation and Flight Planning
2. SMS Theory & Practice
  - Data Acquisition & Analysis
  - Organizational Risk Management for RPA
  - Risk Mitigation & Analysis
  - International Organization Standards & Participation
  - SMS Requirements & Guidance
  - Developing Hazard Identification Processes for RPA
  - Organizational Risk Management for RPA
  - Operations Management
3. Basics of Investigation
  - Special Considerations for RPA Investigation
  - Accident Investigation Techniques for RPA
  - Using UAS for Accident Investigation

4. Regulatory and Operational Environment
  - Basic Types & Applications – components, systems, etc.
  - FAA Regulations & Legislation for RPA
  - International Organization Standards & Participation
  - Certificates of Authorization and Special Certificate of Airworthiness – Process and Function
  - International Regulatory Framework and Development
  - RPA Roadmap for Integration

5. Lab Day for Practical Application

CEU: 4.0

Course Duration: 5.0 Days

Course No.	Dates	Tuition
RPSM 21-1	26 – 30 Oct 2020	\$2800
RPSM 21-2	19 – 23 Apr 2021	\$2800
RPSM 22-1	25 - 29 Oct 2021	TBA

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### DATA FOR SAFETY MANAGEMENT (DATA)

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The analysis of digital flight data collected from actual flights is resulting in tremendous steps forward in aviation safety. It is no longer necessary for an accident or incident to occur in order that safety hazards are revealed. Flight Data Analysis provides a wealth of safety critical information that can be utilized to identify trends, issues and potentially dangerous practices. All modern commercial and business jet aircraft are equipped with flight data recorders that serve as the initial collection devices for flight data analysis. This course will present the basics of flight data analysis based upon real-time flight information. It will present opportunities to analyze collective flight data as would be utilized by a commercial aircraft operator. The course will present animation software that depicts flight profiles and examine other sources of data including video and air traffic control data that may be used in creating a data-based safety case.

**Objective:** To provide first-hand experience in the collection and analysis of safety critical flight data. To create an understanding of the basics of

Flight Data Analysis, how Flight Data Analysis contributes to a SMS, and how Flight Data Analysis can result in positive improvements in aviation safety performance.

**Who Should Attend:** Individuals from aviation enterprises that are involved in or wish to be involved in the collection and analysis of safety related aviation data.

### Course Outline

- Flight Data Recorders, types, capabilities and history
- Evolution of Flight Data Analysis
- Relationship to Aircraft Accident Investigation
- Relationship to SMS
- FOQA, ASAP, ASRS, ADS-B
- Cockpit Voice Recorders
- Video Data
- Recovery of CVR's and FDR's
- Air Traffic Control Data
- Components with Non Volatile Memory
- Commercial Safety Data Services
- Animation of Flight Data

CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
DATA 21-1	05 – 09 Oct 2020	\$2650
DATA 21-2	22 – 26 Mar 2021	\$2650
DATA 22-1	01 – 05 Nov 2021	TBA

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### ACCIDENT/INCIDENT RESPONSE PREPAREDNESS (AIP)

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This course is designed for individuals who are involved in either preparing emergency response plans or responding to incidents and accidents as a representative of their organization. It is based on the premise that accidents are relatively rare events and organizations may have little experience in dealing with them. The aftermath of an accident or serious

incident typically involves complex, challenging, and stressful situations. An organization can significantly reduce the negative impact of these events with preparation and the development of an effective response plan.

*This updated course has been extended to four full days to integrate communications in the digital age.*

**Objectives:** To provide information on effective preparation for accident/incident response, including organizational policy and planning, operational and technical aspects, and humanitarian considerations. To provide the knowledge needed to function effectively during post-accident activities and situations. To provide the skills required to write an effective company emergency response plan.

**Who Should Attend:** Management and safety personnel involved in planning for, response to, or recovery from incidents and accidents.

#### Course Outline

1. Accident / Incident Response Plan Development
  - The Investigation Process
  - Air Carrier / Aircraft Operator Planning Process
  - Effectively Interacting with Government Investigations
  - Informal Communications Discipline
  - Databases and Document Retention
  - Emergency Response Planning
2. Aviation Disaster Victim and Family Assistance
  - Fundamental Needs of Families and Survivors
  - Requirements, Standards, and Best Practices
  - Roles and Responsibilities: Operators, Stakeholders, and Partner Organizations
  - Response Phases and Milestones
  - Practical Skills for Working with Families and Survivors
  - Responder and Organizational Resilience
  - Resources for Plan Development, Training and Exercises
3. Communications
  - Effective Practical Communication Techniques
  - Understanding the Media's Needs
  - Dealing with Digital and Social Media

4. Preparing for Litigation
  - Understanding Administrative, Civil and Criminal Actions
  - Identifying How Organizations Can Become Involved in Litigation
  - Identifying Evidence and Developing an Evidence Preservation Plan
  - Reducing Exposure of the Organization and Personnel
  - Working with Counsel, Experts, and Insurance Carriers

**CEU:** 3.2

**Course Duration:** 4.0 Days

Course No.	Dates	Tuition
AIP 21-1	24 – 27 Aug 2020	\$2250
AIP 21-2	08 – 11 Feb 2021	\$2250
AIP 22-1	30 Aug – 02 Sep 2021	TBA

#### AVIATION LAW AND AVIATION DISPUTE RESOLUTION (LEGAL)

This course is designed to provide information on the legal risks inherent in aviation operations and an overview of the legal system as it relates to aviation safety. It provides understanding of the various legal processes relating to aviation and discusses ways to engage aviation authorities in a responsible and successful manner. The judicial process, current litigation trends, legal definitions, and procedures are also covered.

Our experienced aviation lawyers, as instructors, will encourage “preventative legal medicine” to avoid legal problems. Classes are not just lectures, but include interactive issue-spotting, so that students can get relevant legal advice from their organizations’ lawyers, if and when legal problems develop.

*Aviation Law and Aviation Dispute Resolution is the successor to the previous Legal Aspects of Aviation Safety & Role of the Technical Witness in Litigation courses.*

**Objectives:** To provide the participant with a working knowledge of the legal process and trends affecting aviation safety.

**Who Should Attend:** Individuals in aviation safety who may be involved in aircraft accident investigation, incident investigation, civil litigation or internal aviation disputes.

## Course Outline

1. Aviation Accident & Incident Litigation
  - The Litigation Process
    - Civil Litigation
    - How a Case is Structured
    - Discovery, Deposition, Trial
  - U.S. Legal System
    - Federal and State Court Systems
    - Venue and Choice of Law
  - Investigations and Safety Audits
2. Legal Aspects of Accident Investigation
  - Jurisdiction of Federal Agencies
  - Investigative Power vs. Private Rights
  - NTSB Probable Cause Safety Investigations
  - FAA Role
  - Accident Reports and Litigation
  - Witness Statements
  - Legal Issues of Accident Response Planning
  - Private Accident Investigations – Work Product Protection
  - Accident Liability
  - Comparative Fault
  - Airline, Air Taxi, Corporate and G/A Accident Issues
  - ICAO
3. Pilot's Duty of Care and Legal Aspects of Selected Safety Regulations
  - Role of Governmental Agencies in Enforcing Aviation Safety Regulations
  - FAA Enforcement Alternatives
    - Administrative/Criminal Action
  - Compliance with Safety Regulation
    - Deviation and Non-Compliance
  - Affirmative Defenses, Waivers and Mitigating Factors
  - Aviation Standards of Care: FAR's, Advisory Circulars
  - Special Legal Doctrines Involving Aviation Safety
    - Case Study – Analyzing Legal Issues
    - Burden of Proof, Negligence
    - FAA's Emergency Orders
    - Accident/Incident Reports

4. Product Liability and Safety
  - Theories of Manufacturer Liability
  - The Concept of Defectiveness
  - Various Parties in the Chain of Custody
  - Manufacturer's Defenses
5. Aviation Conflict Resolution
  - Resolving Safety Conflicts
  - Regulatory Disputes
  - ASMS Requirements
  - FAA Regulatory Standards
6. The Role of the Aviation Professional as a Witness in Litigation
  - Scope of Activity
  - Ethical Considerations
  - Role of the Aviation Consultant
7. Consultant as a Technical Witness
  - Getting Started
  - Agreements with Law Firm (Client)
  - Investigation
  - Deposition/Trial Preparation
  - Development of Communication Skills
8. Deposition/Trial Demonstration and Practice
  - Aviation Case Study
  - Deposition Purpose and Goals
  - Trial Testimony of Aviation Professional

CEU: 2.8

Course Duration: 4.0 Days

Course No.	Dates	Tuition
LEGAL 21-1	31 Aug – 03 Sep 2020	\$2250
LEGAL 21-2	24 – 27 May 2021	\$2250
LEGAL 22-1	30 Aug – 02 Sep 2021	TBA



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## PHOTOGRAPHY FOR AIRCRAFT ACCIDENT INVESTIGATION (PHOTO)

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This specialized course in accident investigation is designed to assist the investigator to improve photographic documentation of an accident site. Course participants will take photographs of components and critique them as a class. This course assumes that the investigator is not a professional photographer.

**Objectives:** To provide the aircraft accident investigator with basic accident photographic and video techniques.

**Who Should Attend:** Individuals involved in aircraft accident investigation.

### Course Outline

Digital Photography

Basic Photographic Equipment

Lenses and Camera Controls

Electronic Flash

General Techniques

Macro Photography

Lighting

Picture Identification

Specialized Photographic Techniques

On-Site Photographic Priorities

Student Practice Session

Critique of Student Photographs

Videography

Basics in Videography

Uses of Video in an Aircraft Accident Investigation

**Required:** Each student should bring a Digital SLR camera or digital camera equipped with a Macro (close-up) lens feature, if available, and a flash. A limited number of cameras are available to be checked out from the USC program; please coordinate beforehand to determine availability.

**CEU:** 1.4

**Course Duration:** 2.0 Days

Course No.	Dates	Tuition
PHOTO 21-1	10 – 11 Sep 2020	\$1200
PHOTO 21-2	17 – 18 Feb 2021	\$1200
PHOTO 22-1	30 Nov – 01 Dec 2021	TBA

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## SYSTEM SAFETY (SSC)

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Instruction is given in both system safety engineering and management with emphasis on complex, high technology systems. Engineering methods are illustrated with practical, numerical examples. The principal system safety analysis method is taught with classroom and homework problems. Preparation of a system safety program plan and management of the system safety process in all phases of the system life are examined in depth. A classroom project provides students with the opportunity to apply system safety management and engineering methods while working as a team. Enrichment lectures in special areas of knowledge essential to the system safety process will also be presented. Each student should bring a calculator with statistical functions.

**Objectives:** To provide a level of knowledge of system safety sufficient to manage a system safety program and to perform associated system safety engineering tasks.

**Who Should Attend:** Individuals who have safety responsibilities in the design and operation of complex systems in which an accident can cause substantial loss. Emphasis is upon military projects and contracts.

### Course Outline

#### 1. Quantitative Methods

System Safety Fundamentals

Set/Probability Theories

Bernoulli Process and Binomial Distribution

Poisson Analysis

Series/Parallel Networks

Fault Tree Analysis

Event Tree Approach

Boolean Algebra

Failure Data Analysis

Decision Theory

Risk Ranking

## 2. Management

System and System Safety Life Cycle

Hazard Analysis Techniques including:

Logic/Change Analysis

Energy/Trace

FHA/FMECA

FTA

SCA

Hazard Analysis Types including:

PHA/SSHA, SHA and O & SHA

System Safety Order of Precedence

Amelioration

System Safety Management Tasks

Objectives/Life Cycles

System Safety Program Plan

Types of Risks/Assumption of Risks

**Prerequisite:** Attendees should have an engineering or hard science background.

**CEU:** 6.7

**Course Duration:** 9.5 Days

Course No.	Dates	Tuition
SSC 21-1	12 – 23 Oct 2020	\$3750
SSC 21-2	22 Mar – 02 Apr 2021	\$3750
SSC 22-1	11 – 22 Oct 2021	TBA

## SOFTWARE SAFETY (SFT)

Software requires special attention in system planning, architecture, design and test. The course now includes machine learning and related artificial intelligence (AI). This course presents philosophies and methods of developing and analyzing software and highlights managing a software safety program. Software design principles will be taught to create programs that are fault tolerant and acceptably safe. Several software hazard analyses methods will be evaluated, including Fault Tree/Soft Tree, Software Sneak Analysis and Petri Nets.

**Objectives:** To provide an understanding of the nature of software hazards, root causes, and the methods by which these hazards may be prevented or discovered. The course will also provide instruction in administrative methods and documentation needed to establish and manage a software safety program. Providing evidence for a safety case or proof will also be covered.

**Who Should Attend:** System managers and engineers, system safety engineers and software engineers who are involved with developing systems that possess major software components and are responsible for the safety of such systems. Attending the System Safety (SSC) course and some understanding of software beforehand is highly recommended.

### Course Outline

#### 1. Software

Safety Overview

Definitions and Concepts

Design Requirements

Software Regulations/References

System Safety Team Organization

Risk Processing/Management

Risk by Agency

Hazard and Security

Catastrophic

Probability of Occurrence

Reliability Issues

Probability

Hazard Consideration/Analysis

Risk Assessment and Risk Levels

Program Documentation

Software Reliability/Risk

Software Engineering/Requirements

Software Safety Life Cycle Goals

Security Engineering

VDHL Synthesis

Error Classification and Types

Software Safety Requirements Traceability

Petri-Net Modeling

Software Safety Checklist

Preliminary Hazard Analysis  
 Software Language Analysis  
 Fault Tree Analysis  
 Formal Mathematical Models  
 Software Safety Testing  
   Testing Schemes/Strategies  
 Software Safety Reliability/Maintenance

2. References

Joint Software Systems Safety Engineering Handbook,  
 2010 version  
 Generic Software Systems Safety Program Plan  
 NASA Dryden Flight Research, FAA Software Safety,  
 Office of Secretary of Defense Safety websites  
 Mishap reports: Ariane 5, NASA Mars Climate Orbiter  
 and Mars Polar Lander, Lauda 767  
 MIL STD 882-E  
 Java Safety Guidelines  
 Software Reliability Newsletter

CEU: 2.8

Course Duration: 4.0 Days

Course No.	Dates	Tuition
SFT 21-1	17 – 20 Aug 2020	\$2250
SFT 21-2	17 – 20 May 2021	\$2250
SFT 22-1	16 – 19 Aug 2021	TBA

**ADVANCED SOFTWARE SAFETY (ADVSFT)**

This course builds upon the skills learned in the Software Safety (SFT) course. It is presumed and highly recommended that the student has achieved an active and current understanding of the importance of software safety in the planning, analyses of architecture, design, and code and the testing of automated systems. The course expands upon those skills or as learned in Software Safety (SFT) and presents opportunities to apply them in class in diverse situations using a small unmanned aerial system (sUAS) that is also weaponized.

**Objectives:** To develop practicing skills in writing a Request for Proposal (RFP) for a safety critical system and performing analyses. To develop the practical use of a Safety Assessment Report (SAR). To develop practical skills in deriving requirements and functions leading to a Functional Hazard Analysis (FHA) and Requirements Hazard Analysis for unmanned "sense and avoid" subsystem. Discussion of how to compose a safety argument using metrics results of many analyses of NASA autonomous aerial systems software that was performed using open source tools. Building confidence with your developer's tools, looking into why and what to consider in tools, and how to review your story in your SAR. To develop these skills in a team based working environment.

**Who Should Attend:** Experienced system managers and engineers, system safety engineers and software engineers who have attended SFT or have a solid understanding of the basic software safety principles. Students who have advanced experience will be able to progress in the course but without experience or having just finished the SFT course may present problems with student progress. Principals for Safety (PFS) or Safety Leads who must present to Review Boards should attend to learn active management. Practicing System Safety and Software Safety Engineers who are lining up a professional trajectory into autonomous systems will be better informed by this course. Future follow-on courses will cover deeper safety and security issues, autonomous systems, and in particular artificial intelligence, machine learning (ML) and deep learning (DL) models, life cycles, and contract issues.

**Course Outline**

1. Advanced Software Safety
  - Basic Safety Overview
  - Definitions and Concepts
  - Goals
  - Small Unmanned Aerial System (sUAS) overview
  - ArduCopter and NASA ICAROUS and DAIDALUS software
  - Concept of Operations (CONOPS) for safety
  - Missions and Functions
  - Payloads and Hazards
  - Best Safety Practices in Request for Proposal (RFP)
  - Performing a Functional Hazard Analyses
  - Partitioning and pitfalls

Declaring Software Safety Functions  
 Setting Levels of Rigor (LOR)  
 Work Responsibilities for others...  
 Plans  
 Architecture Analyses, starting with Systems of Systems (SoS)  
 Assessing code, COTS, GOTS, and what to do  
 Code Analysis  
 Software Fault Tree (SFTA)  
 Tools and their use for safety  
 What does all this mean?  
 Final Safety Assessment Report (SAR)  
 You missed your Level of Rigor (LOR) so what now?  
 What about the Review Board?

2. References

Joint Software Systems Safety Engineering Handbook,  
 2010 version  
 MIL STD 882-E  
 Joint Weapons Safety Review Guide  
 FAA Software Safety and National Airspace Requirements  
 FAA Unmanned Airworthiness 8130.34D  
 MIL-HDBK-516C, unmanned systems chapter  
 US Army small unmanned systems RFP  
 Generic Software Systems Safety Program Plan  
 Generic Safety Assessment Report (SAR)  
 NASA Langley Research and software  
 Office of Secretary of Defense Jointly with FAA, Safety guidance  
 USC Software Engineering Center

CEU: 2.8

Course Duration: 4.0 Days

Course No.	Dates	Tuition
ADVSFT 21-1	24 – 27 May 2021	\$2250
ADVSFT 22-1	SPRING 2022	TBA

**INCIDENT INVESTIGATION/ANALYSIS (IIA)**

The investigation of incidents has assumed a predominate role in creating safety within an organization. Incident investigation can yield great benefits in the identification of hazards. This course now integrates a full day lab session, highlighting the practical aspects of incident investigation. The course presents the principles of Management, Investigation and Analysis. It will explain how incidents are discovered, investigated, and reported in writing. The student will learn the techniques of data collection and analysis.

**Objectives:** To provide concepts and practical knowledge to be used in incident investigation and trend analysis programs.

**Who Should Attend:** Supervisors who will investigate incidents, part time safety advisors, Quality Assurance, and ATC supervisors. This a good course for personnel responsible for the data analysis program.

**Course Outline**

1. Investigations:

- Basis for Incident Investigation
- Reporting Criteria
- Reporting Methods
- Investigation Techniques
- Analysis, Root Cause Analysis Techniques,
- Safety Risk Management
- The Failure Modes and Effects Analysis (FMEA) Process
- An overview of Data Programs (FOQA)
- Report Writing
- Recommendations
- Safety Management System Integration Concepts
- Implementation
- Organizational Management, Accountability and Responsibilities

2. Human Factors:

- Stress
- Fatigue
- Decision Making
- Human Reliability and Error Analysis
- Judgment Chain

Attitude  
 Behavior  
 SHEL Models, HFACs

3. Case Study Practical Exercise at Lab

CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
IIA 21-1	28 Sep – 25 Oct 2020	\$2650
IIA 21-2	12 – 16 Apr 2021	\$2650
IIA 22-1	18 – 22 Sep 2021	TBA

**SeMS AVIATION SECURITY MANAGEMENT SYSTEMS (AVSEC)**

This course is designed for individuals responsible for managing and implementing aviation security measures at medium to small size aircraft operators, all airports and Indirect Air Carriers (IAC’s). The course applies the fundamentals of SMS (hazard identification, risk assessment and mitigation of risk) to the field of aviation security. It demonstrates how to conduct a risk-based security program that builds upon national and international standards and requirements. The course presents the PRIFISE operational risk assessment tool as a framework for meeting emerging security threats. As cyber security has become a more important issue this course has course been extended to include a half-day on cyber security. Note: This is a non-SSI course.

**Objectives:** To provide individuals with the knowledge and skills to develop a SeMS based aviation security management system that is compliant with Federal requirements, International Standards and reflective of organizational needs.

**Who Should Attend:** Individuals responsible for implementation of aviation security requirements in medium to small size aircraft operators, all airports and Indirect Air Carriers. This course would also be of interest to those individuals and managers who are seeking to apply a systems management approach to aviation security within their particular areas of jurisdiction. Individuals involved in the design and integration of security measures

into airport environments would find benefit in this course. This course would be beneficial to government agencies responsible for aviation security.

**Course Outline**

1. Primary Lessons of Aviation Security
  - Evolution of the Threat
  - Evolution of the Response
  - Development of Countermeasures
2. Legal Programs as Countermeasures
  - ICAO
  - SeMS
  - U.S. Regulations
3. Principles of Aviation Security Management Systems
  - Positive Leadership Culture
  - Data-based Decision Making
  - Shared Framework with SMS
4. Audits and Inspections
  - Internal Audits
  - Risk Assessment Matrix
  - Synergy with ICAO and National Requirements and Inspections
5. Practical Applications
  - PRIFISE operational risk assessment tool
  - Non-regulatory Security Practices that Make Sense and Diminish Risk
  - Operating in Unfamiliar Environments
6. Security Technologies
  - Cost Benefit
  - Emerging Technologies
  - Cyber Security
7. Threats
  - Threats to Aircraft
  - Threats to Airports
8. Case Studies and Practical Exercise
  - Audit of Aviation Entity
  - Application of SMS Principles



CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
AVSEC 21-1	17 – 21 Aug 2020	\$2650
AVSEC 21-2	17 – 21 May 2021	\$2650
AVSEC 22-1	16 – 20 Aug 2021	TBA

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### SAFETY MANAGEMENT SYSTEMS FOR MANAGERS (SMS-MGR)

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SMS has dramatically changed how safety programs are conducted and managed. Its success or failure is dependent on management understanding and support. ICAO has established it as a standard for airports, commercial aircraft operators and air traffic providers. SMS is being implemented throughout the aviation industry. A key feature of Safety Management Systems (SMS) is the active involvement at all levels of management in the safety process. This course is designed to explain the fundamentals of the SMS process to managers and supervisors. It focuses on the particular functions and responsibilities that managers have within a SMS. The particular benefits of an SMS are detailed. Additionally, potential issues which may cause friction as a result of an SMS are discussed.

This course is an introductory level course. It is not intended as a substitute for the full length SMS courses: Aviation Safety Management Systems (ASMS), Safety Management for Aviation Maintenance (MAINT), or System Safety (SSC). The ten hour format is primarily designed for presentation to managers. It will be conducted both at USC and via on-site contracts.

**Objectives:** To provide managers and supervisors an understanding of the principles of an SMS and a clear vision of the role of the manager.

**Who Should Attend:** Managers and supervisors of aviation operations and aviation related organizations including aircraft operators, airports, and air traffic control facilities.

#### Course Outline

- Overview of SMS
- Management Roles and Responsibilities

Management Accountabilities  
Program Document  
Goals and Objectives  
Risk Assessment  
Change Process Management  
Audits and Safety Reviews  
Motivating Safe Behavior  
Safety Action Groups  
Safety Culture and Climates  
Education and Training  
Just Reporting System  
Latent Conditions/Active Errors  
Accident/Incident Costs  
Mishap Investigation  
Data Analysis  
Obstacles to SMS

CEU: 1.1

Course Duration: 1.5 Days

Course No.	Dates	Tuition
SMS-MGR 21-1	02 – 03 Dec 2020	\$1050
SMS-MGR 21-2	02 – 03 June 2021	\$1050
SMS-MGR 22-1	02 – 03 Dec 2021	TBA

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### SAFETY MANAGEMENT SYSTEMS FOR AIRPORT CONSTRUCTION OPERATIONS (SMS-ACO)

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This course is designed for airport supervisors, managers, operations personnel as well as all stakeholders that are involved in airport construction and construction management. The FAA requires that the Safety Risk Management process and the Construction Safety Phasing Plan processes be integrated into most significant airport construction projects. SRM is the heart of an airport's Safety Management System. How to conduct the SRM process, integration of the CSPP and how these integrate with the airport's SMS is the core objective of the course.

**Objectives:** To provide students with the ability to conduct, participate in or oversee an SRM and/or CSPP process. To provide students with an understanding of how SRM and CSPP perform vital functions within an airport SMS.

**Who Should Attend:** Airport engineers in charge, airport operations personnel, ATC, Tech Ops personnel, engineering company project representatives involved in airport construction, FBO supervisors, AARF personnel as well as airline management pilots.

**Course Outline**

1. The Standard – ICAO SMS
  - Annex 19
  - Annex 14
  - ICAO Safety Management
2. The Framework
  - ICAO + FAA
  - NPRM FAA 2010-0997 (Proposed rule Part 139)
  - 14 CFR 5
3. Types of Requirements
  - Laws, Standards, Regulations, Approved Programs, Advisory Circulars, Orders, Notices, SAFOs, Emergency Amendments
4. FAA Directives (all LOBs) on SMS and SRM
  - 8000.369B
  - 8040.4A
5. Airport Pilot Studies
  - ACRP Synthesis 37 – Lessons Learned
6. Airport Specific Guidance on SMS, SRM
  - Operational Safety on Airports During Construction
    - AC 150/5200 – 37
    - FAA Order 5200.11 (change 3)
    - AC 150/5370 – 2, Implementing CSPP
    - FAA JO 7400.2

7. Exercises
  - CSPP
  - FMEA
  - SRA

**CEU:** 2.1

**Course Duration:** 3.0 Days

Course No.	Dates	Tuition
SMS-ACO 21-1	20 – 22 Jan 2021	\$1625
SMS-ACO 22-1	SPRING 2022	TBA

**SAFETY MANAGEMENT SYSTEMS FOR GROUND OPERATION SAFETY (SMS-RAMP)**

This course presents practices and methodologies for the identification and mitigation of hazards that occur in all phases of airport ground operations. Ground operations are often the environment in which numerous costly incidents resulting in damage or injury occur. Ground mishaps cause cancelled flights, alienated customers, increased personnel costs, injured personnel and a wide range of direct and indirect negative consequences. This course teaches best practices on how to identify and mitigate ground damage and injury mishaps before they happen. The course shows how to integrate these ground safety practices into an airport’s overall SMS.

**Objectives:** To provide airport, air carrier and ground service company supervisors and managers with practices that will reduce ground operation mishaps to personnel and equipment. It provides an understanding of how ground operations safety management is an essential part or an airport’s or air carrier’s SMS.

**Who Should Attend:** Managers, supervisors and safety officers with responsibility for airport ground operations.

## Course Outline

1. SMS Framework Review
  - Safety Policy and Objectives
  - Safety Risk Management
  - Safety Assurance
  - Safety Promotion
2. Ground Operations Safety Key Stakeholders
  - Airport Rescue and Fire Fighting (ARFF)
  - Airport Operations
  - Law Enforcement
  - Federal, State, and Local Agencies – Mutual Aid
  - Airlines/Tenants/General Aviation
  - Military
3. Airport Operational and Security Areas
  - FAR Part 139 Areas – AOA, Aircraft Movement Area, Non-Movement Area
  - 49 CFR 1542 Areas – AOA, Secure Area, SIDA, Sterile Area
4. Airport Ramp Services
  - Under-Wing Operations
  - Above-Wing Operations
5. Ground Operation Hazards
  - Jet Blast
  - HAZMAT
  - Aircraft Operations
  - First Responder Access
  - Construction
  - Pedestrians
  - Noise
  - Weather
6. Accident and Incident Response
  - Off-Airport Property
  - On-Airport Property
  - Communication
  - After Action Reports/Improvement Plans

7. Documentation
  - Current FAR Part 139 Documentation Requirements
  - SMS Documentation Requirements

8. NPRM Review

CEU: 1.8

Course Duration: 2.5 Days

Course No.	Dates	Tuition
SMS-RAMP 21-1	21 – 23 Sep 2020	\$1375
SMS-RAMP 22-1	08 – 10 Sep 2021	TBA

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## THREAT AND ERROR MANAGEMENT (TEM)

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Threat and Error Management (TEM) is being implemented by operators throughout the world. This course is designed to train those who wish to develop a TEM program within their own organizations. Taught by a leader in TEM development, this course provides an applied, practical approach to explaining TEM principles. Attendees will gain sufficient knowledge to implement a TEM program.

The course begins with an introduction to “threats,” which are conditions that increase operational complexity and if not handled properly, can decrease safety margins. Flight operations examples include black hole non-precision approaches, white out conditions and low light conditions, icing, improper use of automation, weather, terrain, mechanical malfunctions and distractions. Maintenance examples are fatigue, poor lighting, unclear work directives, time pressures and uncompleted work that is handed over to another shift. Examples pertaining to cabin crew members are cabin fires — both hidden and overt, command interruptions, disruptive passengers, rushing and malfunctioning cabin equipment.

**Objectives:** To provide class participants with sufficient knowledge to develop a TEM program within their respective organizations. To provide participants with the knowledge to effectively add TEM to an organization’s Safety Management System.

**Who Should Attend:** This course has been designed to appeal to those who are responsible for developing a Threat and Error Management program and/or a Line Operation Safety Audit program within their organization. It will also provide a detailed understanding of TEM to those who wish to improve their professional skills through greater knowledge of TEM and LOSA.

**Course Outline**

1. Introduction to Threats and Errors
  - Threats and Threat Recognition
  - Error Avoidance and Trapping
  - LOSA and the expected training benefits
  - Personnel Performance during a LOSA
2. ABCD’s of Threat and Error Management
  - Assessing Threats and Acknowledging Errors
  - Barriers to Error and How to Effectively Build Them
  - Communications and its Relationship to Threat and Error Management
  - Distraction and Interruption Management
  - SOPs and Their Role in Threat and Error Management
  - Sensibility Check and Ensuring Situational Awareness
3. Case Studies and Class Exercises
4. TEM /LOSA Applied to All Divisions within an Organization
5. TEM Toolkit for Incident and Accident Analysis
6. TEM Applied to Automated Aircraft
7. TEM as an Integral Part of a Safety Management System (SMS)

**CEU:** 1.8

**Course Duration:** 2.5 Days

Course No.	Dates	Tuition
TEM 21-1	09 – 11 Sep 2020	\$1375
TEM 21-2	15 – 17 Mar 2021	\$1375
TEM 21-3	10 – 12 May 2021	\$1375
TEM 22-1	04 – 06 Oct 2021	TBA

**SAFETY PERFORMANCE INDICATORS (SPI)**

Safety Performance Indicators (SPI’s) are essential to the safe operation of any aviation activity. They are analogous to the instruments that pilots need to safely fly an aircraft. This course teaches how SPI’s are developed, monitored, analyzed and modified in order for an organization to correctly know it’s safety performance. SPI’s are an essential part of any SMS. They form the heart of the Assurance component of SMS. They allow an organization to know their safety performance in the past, the current day and project into the future. SPI’s allow an organization to monitor and measure safety performance in order to manage it. The course utilizes guidance provided in ICAO Annex 19 and the ICAO Safety Management Manual Doc. 9859.

The course begins with an introduction to “threats,” which are conditions that increase operational complexity and if not handled properly, can decrease safety margins. Flight operations examples include black hole non-precision approaches, white out conditions and low light conditions, icing, improper use of automation, weather, terrain, mechanical malfunctions and distractions. Maintenance examples are fatigue, poor lighting, unclear work directives, time pressures and uncompleted work that is handed over to another shift. Examples pertaining to cabin crew members are cabin fires — both hidden and overt, command interruptions, disruptive passengers, rushing and malfunctioning cabin equipment.

**Objectives:** To provide the skills to develop, adopt and analyze Safety Performance Indicators in the Safety Management System of an aviation operator.

**Who Should Attend:** Any individual involved in the safety program and specifically the SMS of an aviation operation. This includes military, airline, corporate aviation and other public use entities.

**Course Outline**

1. Role of SPI’s in a SMS
2. ICAO Annex 19 and Safety Management Manual Doc 9859
3. Where is the data derived to build SPI’s
4. How to develop and maintain SPI’s
5. The characteristics of a good SPI

6. Difficulties of choosing too few SPI's or too many
7. Judging the accuracy of your SPI trends
8. How to present SPI's to management and other portions of the organization
9. Practical exercise: Develop SPI's for your organization

CEU: 1.4

Course Duration: 2.0 Days

Course No.	Dates	Tuition
SPI 21-1	24 – 25 Sep 2020	\$1200
SPI 21-2	18 – 19 Mar 2021	\$1200
SPI 21-3	13 – 14 May 2021	\$1200
SPI 22-1	07 – 08 Oct 2021	TBA

### ADVANCED SYSTEM SAFETY ANALYSIS (ADVSS)

This course is a continuation of System Safety course focused on engineering aspects of the course. The objective is to address advanced issues in system safety analysis and broaden the trainees' perspective on system safety issues. Engineering methods addressed in the System Safety course are reviewed briefly and special advanced topics are addressed. Additional methods for system safety analysis are addressed focusing on the application of these methods.

**Objectives:** To provide an advanced level of knowledge of system safety analysis methods.

**Who Should Attend:** Individuals who desire to gain a broad perspective of system safety analysis.

#### Course Outline

- Special Topics in FMEA / FMECA
- Special Topics in Fault Tree Analysis
- Common Cause Failure Analysis
- Event Tree Analysis
- Cause Consequence Analysis
- Hazard and Operability Analysis
- Special Topics in Decision Theory

**Prerequisite:** Attendees should have completed the System Safety Course.

CEU: 3.2

Course Duration: 4.5 Days

Course No.	Dates	Tuition
ADVSS 21-1	07 – 11 Jun 2021	\$2650
ADVSS 22-1	SPRING 2022	TBA

### DAMAGE ASSESSMENT FOR SYSTEM SAFETY (DASS)

Sophisticated mathematical models and methods have been developed to estimate the level of impact of a hazardous condition. This course is intended to provide an overall understanding of these methods to help managers and system safety analysis reviewers understand the analysis conducted and results obtained by the experts in the field. Specifically, methods for modeling the impact of fire and explosion, debris distribution from an explosion, and toxic gas dispersion are discussed.

**Objectives:** To provide an overall understanding of the methods and models used to estimate the damage extent caused by hazardous conditions.

**Who Should Attend:** Individuals who desire to gain a broad perspective of system safety analysis.

#### Course Outline

- Fire and explosion phenomena and modeling
- TNT Equivalents
- Debris field caused by a vessel explosion or missile explosion in the air
- Hazardous Material (liquid) Spill and Evaporation
- Toxic Gas Dispersion
- Expected casualty computation for space and missile applications

**Prerequisite:** Attendees should have an engineering or hard science background.

CEU: 2.1

**Course Duration:** 3.0 Days

Course No.	Dates	Tuition
DASS 21-1	16-18 Sep 2020	\$1625
DASS 21-2	14-16 Apr 2021	\$1625
DASS 22-1	15-17 Sep 2021	TBA
DASS 22-2	SPRING 2022	TBA

*Note: Spring offerings will be held at USC's Washington DC satellite campus.*

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### HAZARD EFFECTS AND CONTROL STRATEGIES (HAZSS)

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System safety analysis requires a clear understanding of sources of harm (hazards) inherent to a system. System safety analysis should identify the energy sources within the system, target the attack and the barriers that reduce the risk. The purpose of this course is to understand hazard effects and control strategy methodologies. The discussions are focused on underlying physical, chemical, and biological characteristics and effects, and hazard control strategies. The following hazards are specifically addressed: electrical hazards, electrostatic discharge, toxicity, kinetic hazards, ionizing and non-ionizing radiation, thermal hazards, noise, fire and explosion, high pressure, etc.

**Objectives:** To familiarize class participants with the underlying physical, chemical, and biological phenomena of and control strategies for various hazards.

**Who Should Attend:** Individuals who intend to conduct or review system safety analyses.

#### Course Outline

1. Overview of Hazards
2. Specific discussions on each hazard type that includes:
  - Physical Properties
  - Chemical Properties
  - Biological impact
  - Barriers that can limit the level of harm

3. The following hazard types will be addressed:

- Electrical hazards
- Electrostatic discharge
- Toxic gases and liquids
- Kinetic energy hazards
- Ionizing radiation hazards
- Non-ionizing radiation hazards
- Thermal hazards
- Noise levels
- Fire and explosion phenomena
- High pressure

**Prerequisite:** Attendees should have an engineering or hard science background

CEU: 1.4

**Course Duration:** 2.0 Days

Course No.	Dates	Tuition
HAZSS 21-1	14-15 Sep 2020	\$1200
HAZSS 21-2	12-13 Apr 2021	\$1200
HAZSS 22-1	13-14 Sep 2021	TBA
HAZSS 22-2	SPRING 2022	TBA

*Note: Spring offerings will be held at USC's Washington DC satellite campus.*

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### HUMAN ERROR ANALYSIS FOR SYSTEM SAFETY (HEASS)

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System safety analysis of engineered systems must often deal with the possibility of human error leading to adverse conditions. Hence human error probability evaluation is an important part of system safety. This course presents a summary of the methods and underlying theory for estimating human error probabilities. The course begins with a discussion on human factors and its influence on human error possibility. The various methods for estimating human error probabilities under different conditions are presented. For each method, their background, underlying theory, advantages and disadvantages will be covered. Typical human error probability values used in various industries will be provided.



**Objectives:** To familiarize class participants with the human error probability evaluation process.

**Who Should Attend:** Individuals who intend to enhance their understanding and capabilities in system safety analysis.

**Course Outline**

- Overview of human factors
- Major events caused by human error
- History of human error probability evaluation
- Performance shaping factors
- THERP method
- ASEP method
- Other methods
- Modeling dependencies among human actions

**Prerequisite:** Attendees should have completed the System Safety Course.

**CEU:** 1.4

**Course Duration:** 2.0 Days

Course No.	Dates	Tuition
HEASS 21-1	05-06 Nov 2020	\$1200
HEASS 21-2	08-09 Apr 2021	\$1200
HEASS 22-1	09-10 Sep 2021	TBA
HEASS 22-2	SRPING 2022	TBA

*Note: Spring offerings will be held at USC's Washington DC satellite campus.*

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**MATHEMATICS FOR SYSTEM SAFETY ANALYSIS (MATH)**

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This course is focused on the mathematics used in system safety. The purpose of this course is to provide the trainees with a working understanding of the mathematical theories underlying system safety analysis. From this course, the trainees will be able to properly interpret the results of a system safety analysis and use it in their intended applications. The course will begin with the fundamentals of probability theory and will cover the uses of that theory for solving various system safety problems. Statistical methods will also be covered in relations to establishing equipment failure frequencies. System safety examples will be used throughout the course. Each student

should bring a calculator with statistical functions.

**Objectives:** To provide a level of understanding of the mathematical concepts used in conducting system safety analyses.

**Who Should Attend:** Individuals who intend to take the system safety course or would like to enhance their understanding of the fundamental mathematical theories used in system theory,

**Course Outline**

- Probability Theory
- Permutations and Combinations
- Bernoulli Process and Binomial and Multinomial Distributions
- Normal Distribution
- Poisson Process and Distribution
- Boolean Algebra
- Statistics and Failure Data Analysis
- Uncertainty Analysis Using Bayesian Method

**Prerequisite:** Attendees should have an engineering or hard science background.

**CEU:** 2.1

**Course Duration:** 3.0 Days

Course No.	Dates	Tuition
MATH 21-1	02-04 Nov 2020	\$1625
MATH 22-1	SPRING 2022	TBA

**PLEASE VISIT [HTTPS://AVIATIONSAFETY.USC.EDU](https://aviationsafety.usc.edu) FOR THE MOST CURRENT INFORMATION.**

## USC AVIATION SAFETY AND SECURITY PROGRAM CALENDAR

### AUGUST 2020

17 – 21	AVSEC	21-1
17 – 20	SFT	21-1
24 – 28	HFH	21-1
24 – 27	AIP	21-1
31 – Sep 4	MAINT	21-1
31 – Sep 3	LEGAL	21-1

### SEPTEMBER 2020

9 – 11	TEM	21-1
10 – 11	PHOTO	21-1
14 – 15	HAZSS	21-1
16 – 18	DASS	21-1
14 – 25	ASMS	21-1
21 – 23	SMS-RAMP	21-1
24 – 25	SPI	21-1
28 – Oct 9	AAI	21-1
28 – Oct 2	IIA	21-1

### OCTOBER 2020

5 – 9	DATA	21-1
12 – 16	HFH	21-2
12 – 23	SSC	21-1
19 – 23	GTAI	21-1
26 – 30	RPSM	21-1
26 – 30	HFMX	21-1

### NOVEMBER 2020

2 – 4	MATH	21-1
2 – 6	HAI	21-1
5 – 6	HEASS	21-1
9 – 20	ASMS	21-2

### DECEMBER 2020

2 – 3	SMS-MGR	21-1
7 – 18	AAI	21-2

### JANUARY 2021

4 – 8	MAINT	21-2
11 – 15	HFH	21-3
20 – 22	SMS-ACO	21-1
25 – Feb 5	AAI	21-3

### FEBRUARY 2021

8 – 11	AIP	21-2
17 – 18	PHOTO	21-2
22 – Mar 5	ASMS	21-3

### MARCH 2021

8 – 12	HFH	21-4
8 – 12	HFMX	21-2
15 – 19	HAI	21-2
15 – 17	TEM	21-2
18 – 19	SPI	21-2
22 – Apr 2	SSC	21-2
22 – 26	DATA	21-2

### APRIL 2021

8 – 9	HEASS	21-1
12 – 16	IIA	21-2
12 – 13	HAZSS	21-1
14 – 16	DASS	21-1
19 – 23	RPSM	21-2
26 – May 7	AAI	21-4

### MAY 2021

10 – 14	GTAI	21-2
10 – 12	TEM	21-3
13 – 14	SPI	21-3
17 – 21	AVSEC	21-2
17 – 20	SFT	21-2
24 – 27	LEGAL	21-2
24 – 27	ADSFT	21-1

### JUNE 2021

2 – 3	SMS-MGR	21-2
7 – 18	ASMS	21-4
7 – 11	ADVSS	21-1
21 – 25	HFH	21-5

### AUGUST 2021

16 – 20	AVSEC	22-1
16 – 19	SFT	22-1
23 – 27	HFH	22-1
23 – 27	MAINT	22-1
30 – Sep 2	AIP	22-1
30 – Sep 2	LEGAL	22-1

### JULY 2021

NO COURSES

### SEPTEMBER 2021

8 – 10	SMS-RAMP	22-1
9 – 10	HEASS	22-1
13 – 14	HAZSS	22-1
15 – 17	DASS	22-1
13 – 24	ASMS	22-1
27 – Oct 8	AAI	22-1

### OCTOBER 2021

4 – 6	TEM	22-1
7 – 8	SPI	22-1
11 – 22	SSC	22-1
11 – 15	HFH	22-2
18 – 22	IIA	22-1
25 – 29	GTAI	21-1
25 – 29	RSPM	21-1

### NOVEMBER 2021

1 – 5	HAI	22-1
1 – 5	DATA	22-1
8 – 19	ASMS	22-2
8 – 12	HFMX	22-1
30 – Dec 1	PHOTO	22-1

### DECEMBER 2021

2 – 3	SMS-MGR	22-1
6 – 17	AAI	22-2

## USC AVIATION SAFETY AND SECURITY PROGRAM SCHEDULE

COURSES	2020					2021											
	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
AVIATION SAFETY MANAGEMENT SYSTEMS (ASMS)		14-25		9-20			22-26	1-5			7-18			13-24		8-19	
AIRCRAFT ACCIDENT INVESTIGATION (AAI)		28 ..... 9			7-18		25 ..... 5		26-30	3-7				27 ..... 8			6-17
HELICOPTER ACCIDENT INVESTIGATION (HAI)				2-6				15-19								1-5	
GAS TURBINE ENGINE ACCIDENT INVESTIGATION (GTAI)			19-23							10-14					25-29		
HUMAN FACTORS IN AVIATION SAFETY (HFH)	24-28		12-16			11-15		8-12			21-25		23-27		11-15		
HUMAN FACTORS IN AVIATION MAINTENANCE (HFMX)			26-30					8-12								8-12	
SAFETY MANAGEMENT FOR AVIATION MAINTENANCE (MAINT)	31 ..... 4					4-8							23-27				
ACCIDENT/INCIDENT RESPONSE PREPAREDNESS (AIP)	24-27						8-11						30 ..... 2				
AVIATION LAW & AVIATION DISPUTE RESOLUTION (LEGAL)	31 ..... 3									24-27			30 ..... 2				
PHOTOGRAPHY FOR AIRCRAFT ACCIDENT INVESTIGATION (PHOTO)		10-11					17-18									30 ..... 1	
SAFETY MANAGEMENT FOR REMOTELY PILOTED AIRCRAFT (RPSM)			26-30						19-23						25-29		
DATA SYSTEMS FOR SAFETY MANAGEMENT (DATA)			5-9					22-26								1-5	
SYSTEM SAFETY (SSC)			12-23					22 ..... 2							11-22		
SOFTWARE SAFETY (SFT)	17-20									17-20			16-19				
ADVANCED SOFTWARE SAFETY (ADVSFT)									24-27								
INCIDENT INVESTIGATION/ANALYSIS (IIA)		28 ..... 2							12-16						18-22		
SEMS AVIATION SECURITY MANAGEMENT SYSTEMS (AVSEC)	17-21									17-21			16-20				
SAFETY MANAGEMENT SYSTEMS FOR AIRPORT CONSTRUCTION OPERATIONS (SMS-ACO)						20-22											
SAFETY MANAGEMENT SYSTEMS FOR GROUND OPERATION SAFETY (SMS-RAMP)		21-23											8-10				
SMS FOR MANAGERS (SMS-MGR)					2-3						2-3						2-3
THREAT & ERROR MANAGEMENT (TEM)		9-11						15-17		10-12					4-6		
SAFETY PERFORMANCE INDICATORS (SPI)		24-25						18-19		13-14					7-8		
ADVANCED SYSTEM SAFETY ANALYSIS (ADVSS)											7-11						
DAMAGE ASSESSMENT FOR SYSTEM SAFETY (DASS)		16-18							14-16					15-17			
HAZARD EFFECTS AND CONTROL STRATEGIES (HAZSS)		14-15							12-13					13-14			
HUMAN ERROR ANALYSIS FOR SYSTEM SAFETY (HEASS)				5-6					8-9					9-10			
MATHEMATICS FOR SYSTEM SAFETY ANALYSIS (MATH)				2-4													

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## PROGRAM INFORMATION

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<i>Main Program Number</i>		310-342-1345
<i>Director</i>	Thomas Anthony	310-342-1349
<i>Business Manager</i>	Jamie Kidder	310-342-1350
<i>Registrar</i>	Raquel Delgadillo	310-342-1348
<i>Accident Lab/Engineer</i>	Daniel Scalese	310-342-1346
<i>Logistics</i>	Oscar De Jesus	310-342-1351
<i>Contract Courses</i>	Holly Inaba	310-342-1352
<i>FAX</i>		844-740-1371
<i>Program E-mail</i>		aviation@usc.edu
<i>Contract Course E-mail</i>		hinaba@usc.edu
<i>Web Site</i>		aviationsafety.usc.edu

### **Class Hours:**

Class hours may vary slightly with each course, but are normally from 8:00 AM to 4:00 PM. Any course that shows a half-day will end by 12:00 noon on the final day of the course.

### **Certificate/Attendance:**

Students are expected to attend all class sessions. Certificates of Completion will only be granted to those who attend at least 90% of a specific class.

### **Tuition:**

A 50% deposit is required for each course. The balance of the tuition payment is due on the first day of class in order to continue the class. For individuals being sent by the U.S. government or corporations contracting with the University, a training document or purchase order is required. Checks should be made payable to the University of Southern California. Tuition fees include all course materials, certificates, audio-visual presentations, and lab time when applicable. Transportation, housing and meals are not included. VISA, MasterCard, Discover and American Express may be used. Credit for classes is dependent upon full payment of tuition.

### **Discounts:**

Discounts are offered to organizations sending three or more participants to an individual class. Please contact the Registrar when registering in order to ensure the discount is applied.

### **Registration:**

All registrations must include an email address to assure written confirmation of space in classes. Registration must be made with a hard copy, scanned PDF copy, or via the website: <https://aviationsafety.usc.edu/registration/>.

### **Cancellation and Refund Policy:**

Participants must inform the program's administrative office of cancellation at least two weeks prior to the course start date. If cancellations are made by phone, a written statement must follow within ten working days of the call in order to receive the refund. **Cancellations of confirmed registrations received less than two weeks prior to the start of the course are subject to 50% of the tuition fees.** If a course is cancelled, enrollees will be notified no less than 10 days prior to the scheduled course opening. USC is not responsible for any airfare penalties incurred in the event of course cancellation. USC has the right to cancel courses and/or substitute faculty when necessary.

### **Transfers and Substitutions:**

If you are confirmed in a course but unable to attend, you may send a substitute or transfer your registration one-time to a future course within the same academic year. The academic year is from July to June.

### **Parking:**

Reduced parking rates are available at the Crowne Plaza Hotel. Long term parking is also available; please see USC Aviation staff for details.

**PLEASE VISIT [HTTPS://AVIATIONSAFETY.USC.EDU](https://aviationsafety.usc.edu)  
FOR THE MOST CURRENT INFORMATION.**

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## ACCOMMODATIONS

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### **Crowne Plaza Hotel and Resort**

5985 Century Blvd., Los Angeles, CA 90045

Adjacent to the USC Aviation Safety Program offices

Telephone: 310-642-7500

Toll-Free: 888-315-3700

Fax: 310-642-7010

\*\$159.00 – Standard Room Rate – July 1, 2020 to June 30, 2021

Room rates include hot breakfast buffet for 1 guest in Landing Restaurant, complimentary WiFi, transportation to/from LAX airport  
Self-Parking – \$8.00/day

*POC:* Janice Funes, ph: 310-258-1302

*E-mail:* janice.funes@ihg.com

*Reservations:* crowneplaza.com/lax

Corporate ID 100193625 & IATA# 99502056

### **Courtyard by Marriott LAX**

6161 W. Century Blvd., Los Angeles, CA 90045

2 blocks from USC Aviation Safety Program offices

Telephone: 310-981-2360

Toll-Free: 888-236-2427

\*\$169.00/night +tax King or 2 Queen beds – July 1, 2019 to June 30, 2020

\*\$179.00/night +tax King or 2 Queen beds – July 1, 2020 to June 30, 2021

Room rates includes hot breakfast, WiFi, 24-hour airport shuttle, one complimentary evening beverage (beer/wine or non-alcohol) and valet parking rate of \$22.00.

*Reservations must be booked under the USCC rate code by calling the Toll-Free number and requesting the USCC rate or use the following link:*  
[marriott.com/event-reservations/reservation-link.mi?id=1583268776899&key=CORP&app=resvlink](http://marriott.com/event-reservations/reservation-link.mi?id=1583268776899&key=CORP&app=resvlink)

### **Renaissance Los Angeles Airport Hotel – Newly Renovated**

9620 Airport Blvd., Los Angeles, CA 90045

8 minute walk from Aviation Offices

\*\$179.00 +tax/Single Occupancy – July 1, 2020 – June 30, 2021

Room rate includes hot breakfast, Lounge access, complimentary WiFi, discounted self-parking (\$20/night +tax), complimentary self-parking for length of stays 5+ nights), and 5,000 bonus Bonvoy Points per visit. Live music on Tuesday, Wednesday & Friday evenings.

*POC:* Kristin Hynes, Sales Executive, Ph: 619-813-9415

*E-mail:* kristin.hynes@marriott.com

*Reservations:* marriott.com/laxrr and use SET# UNC

### **Sheraton Gateway Hotel**

6101 Century Blvd., Los Angeles, CA 90045

Telephone: 310-642-1111

Toll-free: 800-820-3408

\*\$182 + tax/Traditional/Deluxe Room

\*Rates may increase effective 7/1/20. Contact for updated rates.

Room rates include Breakfast Buffet (\$28 value), Club Lounge Access, and High Speed Internet Access (\$15.95 value). *Breakfast and Club Lounge Access will no longer be part of the rate effective 1/1/2021.*

Parking – Valet \$26.00/night +tax. Effective 1/1/21 – Valet \$40.00/night +tax. 5+ Nights Stay Receives Complimentary Valet Parking.

*POC:* Mylene Poblete, ph: 310-642-4827

*E-mail:* mpoblete@sheratonlosangeles.com

*Reservations:* sheratonlax.com and use SET# UNC

### **Four Points Hotel/Sheraton**

9750 Airport Blvd., Los Angeles, CA 90045

Telephone: 310-645-4600

Toll-Free: 800-529-4683

Fax: 310-645-7489

\*\$150.00 +tax for Standard/Deluxe Rooms January 1, 2020 – December 31, 2020

Rates include WiFi in guest rooms and public spaces, breakfast buffet for 1 guest per room each day (\$23/day value), and LAX shuttle 24/7  
Reduced parking of \$18.00 per car/night

*POC:* Arlene Marcia

*E-mail:* arlene.marcia@fourpointslax.com, Ph: 310-649-7074

*Reservations:* marriott.com/event-reservations/reservation-link.mi?id=1581986045963&key=CORP&app=resvlink

### **Residence Inn LAX/Century Boulevard**

5933 W. Century Blvd., Los Angeles, CA 90045  
1 block from USC Aviation Safety Program offices  
Telephone: 310-568-7700  
Fax: 310-568-7727

\*\$181.00 +tax Studio King Suite – July 1, 2020 to June 30, 2021

\*\$201.00 +tax Studio 2 Queen beds – July 1, 2020 to June 30, 2021

Room rates include hot breakfast buffet, WiFi, 24-hour airport shuttle and discounted self-parking (\$20/day)

*POC:* Tonimarie Cruz, Director of Sales; ph: 310-568-7721

*E-mail:* Tonimarie.Cruz@interstatehotels.com

*Reservations:* rilaxreservations@interstatehotels.com OR residenceinnlax.com and use SET# UNC

### **Embassy Suites LAX North**

9801 Airport Blvd., Los Angeles, CA 90045  
Telephone: 310-215-1000  
Fax: 310-417-8968

\*\$181.00 +tax/King Suite or 2-Queen bed Suite

\*Rates may increase effective 1/1/21. Contact for updated rates.

Rate includes hot breakfast buffet, complimentary evening beverage reception, WiFi & complimentary parking.

Reservations should be made three (3) weeks in advance to assure accommodations. To receive the special room rates, you MUST contact the hotel directly and request the “USC Aviation Safety Program” when making your reservations or access the website: laxnorth.embassysuites.com and use Corporate Account 0560035945.

*POC:* Kim Chieppa, Complex Director of Sales

*Email:* kim.chieppa@interstatehotels.com, ph: 310-337-6028

\*These rates are subject to change by individual management

### **La Quinta Inns & Suites**

5249 W. Century Blvd., Los Angeles, CA 90045  
1 mile from classroom location. Must provide own transportation.  
Telephone: 310-645-2200  
Telephone: 1-800-531-5900  
10% OFF BAR (Best Available Rate)

*POC:* Erica De La Cruz

*E-mail:* Erica.Delacruz@laquinta.com

310-645-2200 Option #2 ext. 1322

### **Homewood Suites by Hilton LAX**

6151 W. Century Boulevard  
Los Angeles, CA 90045  
Telephone: 310-431-4720

\$175.00 +tax (August 23, 2020 – June 6, 2021)

\$209.00 +tax (July 1 – August 22, 2019) and (June 7, 2021 – June 30, 2021) Summer Season Rate

These rates include daily hot breakfast buffet, WiFi, 24-hour airport shuttle service and complimentary self-parking.

To reserve, please go to HomewoodSuitesLAX.com and click on Reservations. Enter code 0560035945 in the third field labeled Corporate Account under the section Special Accounts and Rates.

*POC:* Steve Hellmers, Complex Director of Sales

*E-mail:* steve.hellmers@interstatehotels.com

### **H Hotel LAX (Curio Collection by Hilton)**

6151 W. Century Boulevard  
Los Angeles, CA 90045  
Telephone: 310-431-4720

E-mail: steve.hellmers@interstatehotels.com

\$181.00 +tax (August 23, 2020 – June 6, 2021)

\$219.00 +tax (July 1 – August 22, 2019) and (June 7, 2021 – June 30, 2021) Summer Season Rate

These rates include WiFi, 24-hour airport shuttle service, complimentary self-parking, and access to rooftop fitness center and sky deck lounge.

To reserve, please go to HHotelLosAngeles.com and click on Reservations. Enter code K1 in the second field labeled Group Code under the section Special Accounts Rates.

*POC:* Steve Hellmers, Complex Director of Sales

*E-mail:* steve.hellmers@interstatehotels.com

**PLEASE VISIT [HTTPS://AVIATIONSAFETY.USC.EDU](https://aviationsafety.usc.edu)  
FOR THE MOST CURRENT INFORMATION.**

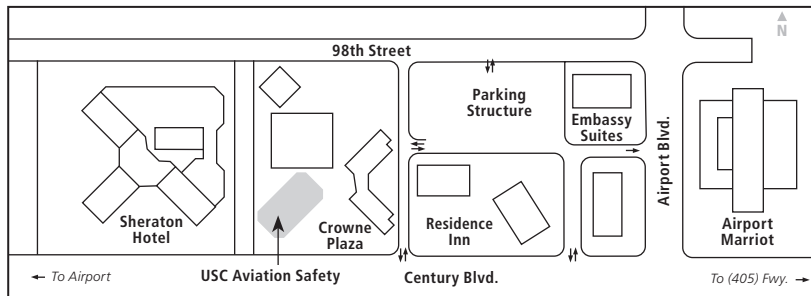


## LOCATION



The USC Aviation Safety and Security Program offices are conveniently located near Los Angeles International Airport (LAX), the arrival point of most of our attendees, and adjacent to a number of hotels that provide accommodations within easy walking distance to our classes.

Our address is 6033 West Century Boulevard, Suite 920, Los Angeles, CA 90045.



## REGISTRATION

FIRST NAME \_\_\_\_\_ M. I. \_\_\_\_\_ LAST NAME \_\_\_\_\_

EMAIL ADDRESS \_\_\_\_\_

POSITION/TITLE \_\_\_\_\_ EMPLOYER \_\_\_\_\_

EMPLOYER ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE/PROVENCE \_\_\_\_\_ COUNTY \_\_\_\_\_ ZIP/POSTAL CODE \_\_\_\_\_

DAYTIME PHONE \_\_\_\_\_ FAX NUMBER \_\_\_\_\_

COURSE(S) \_\_\_\_\_ DATE(S) \_\_\_\_\_ TUITION\* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Bill my credit card for \$ \_\_\_\_\_

Mastercard       Visa       Discover

CARD# \_\_\_\_\_ EXP. DATE \_\_\_\_\_

AUTHORIZED SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

Company PO# \_\_\_\_\_

Company check or cashiers check enclosed

### Mail or Fax to:

University of Southern California  
 Aviation Safety and Security Program  
 6033 W. Century Boulevard, Suite 920  
 Los Angeles, CA 90045  
 Telephone: 310-342-1345      Fax: 844-740-1371

**Online Registration: [aviationsafety.usc.edu/registration](http://aviationsafety.usc.edu/registration)**

**REGISTRATION VALID ONLY WITH AUTHORIZED SIGNATURE.**

*\*A fifty percent (50%) deposit is due prior to the course. The balance of the tuition is due by the end of the first day of class or the student will not be allowed to continue the course. If other payment arrangements have been made, i.e., purchase orders, wire transfers, etc., please note this on your registration form or contact us so that we may update your records.*