



WHITE EAGLE  
AEROSPACE



# Fundamentals of Electro-Optics and Infrared Sensors

MAKE YOUR CAREER SOAR

# Welcome

Thank you very much for your interest in White Eagle Aerospace. Since our founding in 2006, we have become a trusted leader in professional technical training and education throughout the aerospace industry.

As a fellow aerospace professional with nearly 40 years of industry experience, I understand the critical need for ongoing technical training in the workplace. White Eagle Aerospace was established in order to meet this pressing need.

For many years, we have recognized a looming crisis in the aerospace workforce. Throughout the industry, there is an increasingly bimodal distribution of aerospace professionals. One end of that distribution contains young, well trained, highly motivated, but very inexperienced professionals. The other end of that distribution involves individuals who have been around for a long time, have a great deal of experience and are on their way out of their chosen profession. This leaves a valley between the two.

Who is going to pass the baton to the upcoming generation of aerospace professionals? Where will they get their knowledge – knowledge that goes beyond academia and even graduate degrees? Much of what they need to know is not available in today's standard university curricula. What they need is:

- Specialized knowledge over a range of disciplines.
- Knowledge provided by an experienced expert in the field.
- Knowledge conveyed by a master instructor.

White Eagle Aerospace recognizes these issues and provides effective solutions for your workforce. We are pleased to present you with this brochure, which outlines our Fundamentals of Electro-Optics & Infrared Sensors (FEOIR) professional short course. Our team of industry experts and master instructors is dedicated to your success. Should you have any questions about our course catalog or desire more information on how we can help MAKE YOUR CAREER SOAR, please contact us today.

Best Regards,



John Terry White,  
President/CEO  
White Eagle Aerospace



## About Our Company

**Whether you are new to the aerospace industry or have years of professional experience, we are your provider-of-choice for expert technical training.**

**Acquiring key knowledge, critical lessons-learned and technical know-how are crucial ingredients for success in today's complex and highly competitive aerospace market. Our nationally-acclaimed short courses cover a wide range of highly useful technical subjects. Each course is delivered by a subject matter expert who is also an expert technical instructor.**

**We offer you comprehensive technical training in essential topics, with minimal time away from work – all at a price that fits today's tight training budgets.**





# Target Audience

**The Fundamentals of Electro-Optics & Infrared Sensors (FEOIR) short course is intended for anyone seeking instruction on EO-IR Sensors, Weapons, and Electronic Warfare Systems.**

The course provides the theoretical background necessary to understand remote sensing of ultraviolet, visible, and IR electromagnetic energy, and how it is used in airborne military applications such as target detection, target acquisition, target tracking, reconnaissance, ground mapping, airfield damage assessment, navigation, communications, countermeasures, and weapons delivery.

Delivered by a master instructor and subject matter expert with over 35 years of professional aerospace experience, this 5-day intensive training course will provide participants with invaluable real-world knowledge, enhanced understanding and improved competency in this key discipline. The depth and breadth of real-world practical experience the instructor brings to this classroom is an invaluable resource for all who are concerned with the performance aspects of EO/IR systems.

## Who Will Benefit

- Aircraft Systems Engineers
- Missile Systems Engineers
- Flight Test Engineers
- Software Specialists
- Mission Planners
- Ops Research Specialists
- Weapons Specialists
- Flight Crew
- Systems Engineers
- Electrical Engineers
- Radar Specialists
- Sensor Technologists
- Project Managers
- Program Managers
- College Students

## Group Discounts

White Eagle Aerospace is dedicated to meeting your organization's professional training needs. In order to better serve you, we offer special group discounts rates and on-site training. If you have a group of 15 or more participants, we will bring our nationally acclaimed FEOIR short course to your location at a discounted rate. Please contact us today to learn how we can help **MAKE YOUR ORGANIZATION SOAR!**





# Course Description

**The Fundamentals of Electro-Optics & Infrared Sensors (FEOIR) short course provides expert instruction on EO/IR Sensors, Weapons, and Electronic Warfare Systems.**

This intensive short course will provide you with a comprehensive training experience that covers the basic theory and principles of how electromagnetic energy in the optical spectrum (visible, infrared, and ultraviolet light), combined with modern electronics, avionics, and digital imagery processing, is used for militarily-significant purposes.

The course provides the theoretical background necessary to understanding remote sensing of ultraviolet, visible, and infrared electromagnetic energy, and how it is used in airborne military applications such as target detection, target acquisition, target tracking, reconnaissance, ground mapping, airfield damage assessment, navigation, communications, countermeasures, and weapons delivery.

The principles presented in this highly informative course are immediately useful on the job and are directly applicable to a broad range of real-world design, test and evaluation problems. FEOIR is an excellent first course for the novice and a great refresher course for the experienced practitioner. Most importantly, the course is taught by an instructor who is both a world-renown expert in sensor systems and a gifted master instructor.

## Key Course Topics

- The Electromagnetic Spectrum
- Remote Sensing Theory
- Radiation Physics
- Atmospheric Considerations
- Target & Background Signatures
- Optical Materials
- Photonic Detectors
- Visible Light Systems
- Image Intensified Systems
- Infrared Systems
- History of Forward Looking IR
- Intelligence, Surveillance & Reconnaissance Systems
- Laser Systems & Fundamentals
- EO/IR Countermeasures
- Infrared Missile Systems
- Expendables & Decoys
- Camouflage, Concealment & Deception (CCD)
- Missile Warning Receivers
- Directed Infrared Countermeasure Systems (DIRCM)
- Legacy DIRCM Systems
- Advanced DIRCM Concepts
- Test and Evaluation







# Course Outline

**The Fundamentals of Electro-Optics & Infrared Sensors (FEOIR) short course is an intensive 5-day training program that provides a maximum training experience to aerospace professionals with minimum time away from work.**

## Fundamentals of Electro-Optics & Infrared Sensors Module Outline

Day	Module	Lecture Topic	Day	Module	Lecture Topic
1	1	Course Administration	3	16	Examination of the IR Threat
	2	Introduction EO/IR Systems and Missions		17	Expendables and Decoys
	3	Electromagnetic Spectrum		18	CCD EO-IRCM Techniques
	4	Black Body Radiation	4	19	Missile Warning Receivers
	5	Atmospheric Conditions		20	DIRCM
	6	Targets and Background		21	Integration Test and Evaluation
7	Optical Materials	22		Measures of EO-IR Performance	
2	8	Detectors	23	EOIR Modeling & Simulation	
	9	Visible Light Systems	24	EOIR Ground Test	
	10	Night Vision Systems	5	25	EOIR Flight Test
	11	IR Systems		26	T3 Darkstar Brief
	12	ISR Systems		27	SYERS P3I Brief
13	Laser Systems	28		Emerging Technologies: LADAR Seekers	
14	IR Missile Systems	29		EO Displays	
3	15	Introduction to EOCM-IRCM Terminology	30	End-of-Course Review	



# Information at a Glance

**The Fundamentals of Electro-Optics & Infrared Sensors (FEOIR) short course provides participants with a comprehensive training experience in EO-IR Sensors, Weapons and Electronic Warfare Systems.**

The short course provides the theoretical background necessary to understand remote sensing of ultraviolet, visible and IR electromagnetic energy, and how it is used in airborne military applications such as target detection, target acquisition, target tracking, reconnaissance, ground mapping, airfield damage assessment, navigation, communications, countermeasures and weapons delivery.

Delivered by a master instructor and subject matter expert with over 35 years of professional aerospace experience, this 5-day intensive training program will provide participants with invaluable real-world knowledge, enhanced understanding and improved competency in this key discipline.

## Contact White Eagle Aerospace

**White Eagle Aerospace**  
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[training@whiteeagleaerospace.com](mailto:training@whiteeagleaerospace.com)  
**520-219-0526**

## Key Course Information

- **Instructor:** John L. Minor
- **Duration:** 5 instructional days; 40 instructional hours.
- **Materials:** Comprehensive set of course slides in bound form and on DVD. Two practical wall charts: (1) an electromagnetic spectrum wall chart and (2) a weather effects on EO/IR/MMW sensors wall chart.
- **Cost:** \$1,760 for single seat.
- **Registration:** Please visit our website to view the most current Course Calendar. To register for a scheduled course, simply complete and submit the online registration form.
- **Group Discounts:** In order to better serve your organization, we offer special group discount rates and on-site training. For information, please contact Phyllis White at [pjwhite@whiteeagleaerospace.com](mailto:pjwhite@whiteeagleaerospace.com).





# John L. Minor

## Sensors & Systems Instructor

**John L. Minor has 35 years of technical and operational experience. He is an internationally recognized expert on the subjects of military sensors, systems, and flight test. He is also a highly decorated technical instructor and lecturer.**

During his career, Minor served on the technical staff of the Air Force Flight Test Center, the USAF Test Pilot School, Lockheed Martin and the Lockheed Skunk Works® and others. He began his career with the 9th Strategic Reconnaissance Wing as a sensor system specialist on the SR-71 and U-2 aircraft.

He has worked on a number of high-value military programs to include the Low Altitude Navigation and Targeting Infrared for Night (LANTIRN), the F/A-18D (RC) Advanced Tactical Air Reconnaissance System (ATARS), and the RQ-3A TIER III Minus (Darkstar) Low Observable (LO) Unmanned Air Vehicle (UAV), as well as numerous other classified programs.

### Courses Offered

- **Fundamentals of Electro-Optics and Infrared (EO/IR) Sensors**
- **Fundamentals of Unmanned Air Vehicles (UAV), Missions & Systems**
- **Principles of Directed Infrared (IR) Countermeasures**
- **Test and Evaluation of Avionics and Weapons Systems**

As the USAF Test Pilot School's former Technical Director (2004-2008) and Systems Master Instructor (1999-2003), Minor was responsible for developing a state of the art curricula and teaching sensors, weapons, systems, electronic warfare, directed energy, and unmanned systems theory, operations, and flight test to the next generation of USAF Test Pilots, Electronic Warfare Officers, and Flight Test Engineers.

Minor has taught many short courses for Society of Flight Test Engineers, the Association of Old Crows (AOC), Technology Training Corporation, and has lectured throughout Europe to the Royal Aeronautical Engineering Society (RAeS) and Technical Universities.

Minor holds BSEE/MSEE degrees from the University of New Mexico/Air Force Institute of Technology. He has been honored with numerous awards and decorations to include: the 2012 Team Hill Spirit Award, the 2010 SFTE Kelly Johnson Award for Outstanding Achievement in the Field of Flight Test Engineering, the 412th Test Wing's Senior Leader of the Year Award, the SFTE Directors and Fellow Awards, the San Fernando Valley Engineers' Council Distinguished Engineering Project Achievement Award and the Engineers' Council Distinguished Engineering Life Achievement Award for his educational contributions to the Edwards AFB engineering community.

Most recently, Minor served as Chief of the Systems Engineering Division for the Ogden Air Logistics Center Engineering Directorate. He is currently Division Chief over Workforce Management and Development for over 1300 scientists and engineers at Hill Air Force Base.

### Contact Information

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