

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel: +972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management

Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Courses given by Dror Artzi

Mr. Artzi shares his vast practical experience in aeronautical engineering by giving several courses as describes here. The courses are designed to familiarize design, liaison, and stress engineers with the process and stages of aircraft design, the concept of airframe design and aircraft systems design & integration.

The courses aims to provide a background of airframe structural design and to familiarize the participants with materials, production process, fasteners selection, design to cost considerations Etc. Since most current aircrafts and UAVs are design for low RCS a special course is available for low RCS design considerations. The cures will be tailored to the customer requirements and can be presented as short basics course (as background or refresher course) or in-depth detailed course, according to customer specifications.

Phases of Air vehicle Design

1. Overview
2. Conceptual Design Process
 - a. Design Requirements & Objectives
 - b. Requirements Evaluation and Assessment
 - c. Technologies Availability
 - d. Initial Sizing
 - e. Initial Lay-Out (Structure & Systems Arrangement)
 - f. Weight Estimation
 - g. Weight & Balance
3. Configuration Development
4. Design Concept Trade Studies
 - a. Configuration Level – Major
 - b. Configuration Level – Medium
 - c. Structure
 - d. Aerodynamics
5. Cost Estimation & Impact
6. Multi Discipliner Approach

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel: +972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Air vehicle Structure Detail Design

1. Structural design overview
2. Design requirements and validation of aircraft loads
3. Loads Acting on the Air Vehicle
4. load paths
5. Structural Arrangement of Major Elements
6. Production Breaks Considerations
7. Wing Design
 - Wing Design Parameters
 - Wing Structure Arrangement
 - Main Torsion Box
 - Leading Edge Elements
 - Trailing Edge Elements
 - Control Surfaces
 - Systems Integration
8. Fuselage Design
 - Fuselage Design Parameters
 - Fuselage Structure Arrangement
 - Main Longitudinal Load-Carrying Structure
 - Frames
 - Skins
 - Production Breaks
9. Wing – Fuselage Connection
10. Tail Section Design
11. FAA Airworthiness Regulations

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel: +972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Materials Selection

1. Introduction for Air Vehicle Materials
2. Material Properties
3. Aluminum Alloys
 - a. General
 - b. Alloys Designation System
 - c. Corrosion Resistance
 - d. Materials Selection Considerations
 - e. Typical Applications of different Alloys (2024, 7075, 6061 etc.)

4. Composite Materials
 - a. Introduction
 - I. Materials Overview
 - II. Fibers
 - III. Resins & Adhesives

 - b. Materials Properties
 - I. Core Materials
 - II. Fibers

 - c. Materials Selection Considerations
 - d. Applications

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel: +972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Fasteners Selection

1. Fasteners Selection Considerations
 - Characteristics Comparison
 - Installed Cost
2. Compatibility of Fasteners and Materials
3. Familiarization with Fasteners Types
 - Solid Rivets
 - Blind Fasteners
 - Hi-lok
 - Lock-Bolts
 - Bolts
 - Nuts
 - Nut Plates
 - Washers
4. Fasteners for Composite Materials Structures
 - Rivets
 - Blind Rivet
 - RivNut
 - Hi-lok
 - Nut Plates
5. Use of Fasteners Suppliers Catalogs

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel:+972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Corrosion Prevention for Air Vehicle Structures

1. Overview
2. Adequate Design Considerations
 - a. Wing Structure
 - b. Fuselage Structure
 - c. Materials Compatibility (Dissimilar Materials)
 - d. Corrosion in Cavities
 - e. Production Break Corrosion
 - f. Fuel Tanks Corrosion
 - g. Inactive / Acceptable Example
3. Surface Protection
 - a. Coating Materials
 - b. Finish Type Selections
 - c. Implementation
 - d. Materials Selection

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel:+972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Design to Cost (Manufacturability)

1. Cost Categories
2. Material Cost
3. Fabrication Cost
4. Assembly Cost
5. Design for Manufacturability
 - a. Assembly Cost
 - b. Cost of New Parts
 - c. Fabrication Ease
 - d. Ease of Assembly
 - e. Top Down Assembly
6. Machining Principles for Cost Reduction
 - a. Part Shape
 - b. Machining Considerations
 - c. Finish Level Cost
 - d. Dimensional Cost
 - e. Tolerance Cost
7. Tooling Cost
8. Geometry Considerations
9. Composite Structures
10. Manufacturability of Honeycomb Sandwich Structures
11. Design Guide Lines for Low-Cost
 - a. Airframe
 - b. Flight Control
 - c. Engines and Installation
 - d. Electrical Power System
 - e. Hydraulic System
 - f. Fuel System
 - g. Software

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel:+972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Aircraft Systems

1. General and Overview
2. Propulsion System
 - a. Introduction
 - b. Engine Selection
 - c. Engine Installation
3. Fuel System
 - a. Introduction
 - b. Fuel System Lay Out & Installation
4. Hydraulic System
 - a. Introduction
 - b. Hydraulic Systems Components
 - c. Hydraulic System Lay Out & Installation
5. Landing Gear
 - a. Landing Gear Configuration
 - b. Landing Gear Sizing
 - c. Ground Clearance Criteria
 - d. Landing Gear Installation
6. Avionic System
 - a. Introduction
 - b. Navigation
 - c. Communication
 - d. Flight Control
 - e. Weather Systems
 - f. Collision Avoidance Systems
 - g. Mission Tactical Avionics & Sensors
 - h. Radar
 - i. Electro Optics Sensors

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel:+972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dr-or-aero.com

Stealth Aircrafts – Design for Low RCS

1. Radar Cross Section Fundamentals
2. First Order Specular RCS Components
3. Basics and Formulas
4. Detection Range
5. RCS Contributors
6. Case Study (Familiarization with several examples: F-117, B2, F-22)
7. Unmanned Stealth
8. Radar Absorbent Materials
9. Radar Cross Section Measurement.
10. RCS Reduction Approches
11. Practical Guide-Lines for Low RCS Air Vehicle Design



Project Management

1. Overview of Project Management
2. Project Development stages
3. Planning a Project
 - a. Specification
 - b. Providing Structure
 - i. Work breakdown structure (WBS)
 - ii. Tasks Allocation
 - iii. Guesstimation (estimate of the time involved in the project)
 - c. Establishing Controls
 - i. Established Milestones
 - ii. Established means of communication
4. Team Building
5. Management Activities
 - a. Budget Control
 - b. Configuration Management
 - c. Risks assessment and Management
 - d. Management of Information
 - e. Management of Testing
 - f. Management of Quality
 - g. Management of Procurement
 - h. Management of ILS
 - i. Management of the Unexpected Surprises
6. Planning and Control Tools
 - a. Tree structure charts
 - b. Gantt chart
 - c. Gantt charts and resource planning
 - d. Pert charts
7. What makes great Manager

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel:+972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management



Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Winning Proposals Writing

Writing a clear and concise text on a technical subject is very valuable and rare commodity in aerospace, but writing a clear and structured proposal which covers all the customer requirements represents the top of a technical writing.

Mr. Artzi offers his vast experience as engineer, Director for Business Development unit and General Manager of Composite Aircraft Structures Manufacturing Plant, positions in which he accumulated huge experience in Proposal Writing and presentation.

The course starting with writing the overall scope of the proposal.

Proposal Writing course covering the following stages :

- RFP/Documents Review
- Identification of Partners to participate in bid.
- Establish Technical Strategy
- Establish the WBS (Work Breakdown Structure) of the proposed program
- Write the technical section of the proposal
- Write the financial section
- Establish the personnel and organization for the proposed program
- Write the Past Performance Reference Section
- Packaging of the Proposal (Select cover design Etc.)
- Applying final touches (Spell check, Gather appendix materials Etc.)
- Proposal Production
- Proposal Delivery/Logistics

26 Ha' yarkon st. Haifa 34461 ISRAEL
Tel: +972 4-8266114
FAX: +972 4-8243095
Cell: +972 52-7456659

Aerospace Consulting
Design, Analysis, Projects Management

Dror Artzi
drorar1@netvision.net.il
www.dror-aero.com

Unmanned Air Vehicle (UAV) Design and Development Course

This two weeks course aims to introduce to the participants, conceptual approach and development of the complete unmanned air vehicles (UAV) design.

The course consist of about 60 hours of lectures, including an overview of existing UAVs and their capabilities, covering the aspects of structures, aerodynamics, weight & balance, flight performance, stability and control, UAV systems and systems integration (propulsion, fuel, etc.) , landing gear, UAV sensors (EO/IR) and integration, design aspects of stealth, and aspects of operating & mission, as well as visit to local industry involved with UAV manufacturing. A presentation of future developments, approaches and technologies in the area of UAV will summarize the course.

The course lecturers are highly experienced engineers and UAV pilots which combine practical and academic experience.

It is recommended that the participants in the course will have some general background in aircraft design, so this course will enhance their know-how and capabilities in the field of UAV design.

The Course was held recently in Haifa – Israel for 11 scientists from abroad, in cooperation with the Technion – Israel institute of technology. The whole course was organized by Mr. Dror Artzi of Aerospace Consulting and was presented by him & a team of very experience engineers. The Course was highly appreciated by all the participants as being very practical as well as academic and theoretical.

* **Aerospace Consulting** is also offering other courses according to customer specifications

* The availability of the courses is subjects to the approval of the Israeli authorities.