Duration	5 days	
Tuition Fee	CHF 2200 per participant	
Instructors	Beat Zimmermann (IFP)	Alternatively Robert Bukovics (IFP)
Certificate	ANI Certificate	

Questions at a glance	Answer
ICAO recognised?	No, there is no such thing as an ICAO recognition for training. ANI is a State-approved training provider and complies with all ICAO training regulations.
Pre-requisites?	Yes. Please see below for details.
Does ANI provide accommodation?	No. Please check the hotel list provided in the location documentation.
Daily schedule?	9.00 - 16.00
Ending Time on the last day?	Typically 12.00 - 13.00
Venue?	Please check the information in the course calendar.

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1. ANI Procedure Design Training Program and Concept

All ANI Procedure Design/PANS-OPS courses cope with ICAO document 9906 "Quality Assurance Manual For Flight Procedure Design", vol. II "Flight Procedure Designer Training".

2. Advanced Level Procedure Design Training

Based on educational experience some of the more complex criteria are covered as advanced training. It was observed that mastery of skills is better when the basic concepts of procedure design are consolidated with some practical work before the advance level training is started. Helicopter PinS design is a different animal in many aspects. Helicopter IFR operations lag behind fixed wing IFR operations by decades. The whole system is not used to deal with helicopter specifics. That starts with the pilots themselves who are often less experienced on instruments than their fixed wing colleagues. Procedure Designers rarely have a helicopter background and finally also the whole ATM system including the regulator is not experienced to deal with helicopter procedures. That makes helicopter PinS complex by nature.

This course highlights the challenges faced and covers all the helicopter specific criteria. Time allowing it usually also consists of a visit to a HEMS base to see a typical modern helicopter's instruments and navigation systems hands on.

3. Pre-requisites

To join an ANI advanced level course, students must demonstrate that they have undergone basic training, preferably at ANI, the Singapore Aviation Academy or ENAC Toulouse. Furthermore students should have some basic level procedure design experience (at least OJT after the basic training). If these requirements are not met, the ANI cannot guarantee successful completion.

PRE-REQUISITE SKAS

(extract from ICAO do. 9906, vol. II)

3.3.1 Mathematics

3.3.1.1 Algebra
Students should be competent in Algebra to at least the level of resolving equations with 2 unknowns and handling operations of the 3rd level (Exponentiation, Radical, Logarithms, Angular functions). This requirement will assure the understanding of formulas given in the relative criteria documents as well as the ability to follow rationales, on which certain criteria are based.

3.3.1.2 Geometry
Students should be familiar with the classical Euclidian Geometry (Plane Geometry, Solid Geometry) as well as Thales and Pythagoras constructions.

3.3.1.3 Trigonometry
Students should be competent in all Trigonometry Functions such as Sine, Cosine, Tangent, Cotangent, Secant and Cosecant. Furthermore they should be familiar with Trigonometry Theorems such as the Theorem of Sines and the Theorem of Cosines.

3.3.1.4 Probability and Statistics
Students should have basic knowledge of Statistical and Probability Mathematics, particularly an understanding of the Gaussian (Normal) distribution.

3.3.2 Aviation or Aviation-related pre-requisites

The job profile of an Instrument Flight Procedure Designer requires knowledge in various fields of activity in aviation. Training providers are encouraged to offer ab-initio training and that the following prerequisites are met by the student so as to ensure that the length of training can be optimized.

3.3.2.1 Air Traffic Management
Students should demonstrate fundamental knowledge of Air Traffic Management (ATM) as in ICAO doc. 4444 (PANS-ATM), as well as understanding the broad concept of ATM which consists of ATS including ATC (Air Traffic Control), ATFM (Air Traffic Flow Management) and ASM (Airspace Management), other fields related to ATM such as route spacing, ATC separation, aviation weather, etc.

3.3.2.2 Navigation, Navigation Systems and Geography
Students should demonstrate knowledge of Navigation, Navigation Systems and Geography to the level of any pilot’s licence with Instrument Rating (IR). It is however not a requirement to hold such a license.

3.3.2.3 Aircraft Operations
Students should demonstrate knowledge of the basics of flying and aerodynamics. It is however not a requirement to hold a pilot’s license.

3.3.2.4 Aircraft Performance
Students should demonstrate knowledge of Aircraft Performance to the level of any pilot’s license with Instrument Rating (IR). It is however not a requirement to hold such a license.

3.3.2.5 Aeronautical Information Services
Students should demonstrate fundamental knowledge of Annex 15 (Aeronautical Information Services).

3.3.2.6 Aerodrome safeguarding
Students must be familiar with the basic requirements for aerodrome safeguarding (Annex 14 Obstacle
limitation surfaces, Aerodrome reference codes).

3.3.2.7 Geodesy

Geodesy, also called geodetics, is the scientific discipline that deals with the measurement and representation of the earth, its gravitational field and geodynamic phenomena (polar motion, earth tides, and crustal motion) in three-dimensional time varying space. Geodesy is primarily concerned with positioning and the gravity field and geometrical aspects of their temporal variations, although it can also include the study of the Earth's magnetic field.

Students should demonstrate fundamental knowledge in the following areas of Geodesy:

• Geoid and reference ellipsoid
• Coordinate systems in space
• Coordinate systems in the plane
• Heights
• Geodetic Datums and Datum conversion • Point positioning
• Units and measures on the ellipsoid
• Geodetic Principal Problem
• Geodetic Inverse Problem

3.3.3 Language

In order to progress through the competency-based training outlined above, trainees need to demonstrate their ability to achieve terminal objective related to the competency elements. As training will be delivered within a certain timeframe, it is important that trainees learn the material within the time allocated. For this reason, proficiency in the language in which training will be delivered (instruction and training materials) is essential.

For courses in English, it is suggested that training providers require a score of 550 in the written TOEFL (Test of English as a Foreign Language), 213 in the TOEFL Computer Based Test, 79 in the TOEFL Internet Based Test and 750 in TOEIC (Test of English for International Communication) for students whose native language is not English. Alternatively, a score of 6.5 in the IELTS Academic Module (International English Language Testing System) can be accepted. Students having studied at an English speaking institution for one year or longer can be exempted from providing a TOEFL or IELTS score.

(end of extract)

Note: For ANI courses, an ICAO language proficiency Level 5 is also accepted. Level 4 is not sufficient to understand the lectures.

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4. Training Phases

The above pre-requisite SKAs refer to entry into "initial training", which according to doc. 9906 is the first time that a Flight Procedure Design Student gets in touch with actual Flight Procedure Design criteria. Any required training to get to that level is called "ab-initio". Initial Training **MUST** be followed by an On-the-Job (OJT) training phase. The length of such a phase can be specified be the PDSP (Procedure Design Service Provider). Typically an OJT phase will not be shorter than 15 weeks. So when joining advanced level training, the above prerequisites still apply, plus the fact that the student must have undergone basic (initial) flight procedure design training.

5. Course Rundown

Phase	Topic	Details
Setting the stage	Rotorcraft experience	General issues when designing procedures for helicopters. Awareness of helicopter specific issues
Setting the stage	Heliports and Annex 14	Obstacle safeguarding for heliports according to ICAO Annex 14. Issues with the published SARPs. Helicopter Performance Classes.
Introduction to Criteria	PinS concept	Why was the PinS concept introduced
Criteria	PinS Approaches to LNAV minima	All relevant competencies step-by-step to design a PinS Approach to LNAV minimum. Identification of problems with existing criteria and introduction to changes in upcoming AMDT 8 (effective date Nov 2018)
Mastery Test	Heli PinS to LNAV minimum	Design a Heli PinS proceed visually in a sample scenario
Criteria	PinS Departures	All relevant competencies step-by-step to design a PinS Departure. Identification of problems with existing criteria and introduction to changes in upcoming AMDT 8 (effective date Nov 2018)
Mastery Test	Heli PinS Departure	Design a Heli PinS proceed visually Departure
Criteria	PinS to LPV minima	Design criteria for a PinS procedure to LPV minimum based on APV-I performance
Mastery Test	PinS LPV	Design a PinS LPV in the same scenario as the previously designed PinS LNAV.