ITPS
CANADA

SHORT COURSE MODULES

INTERNATIONAL TEST PILOTS SCHOOL

The International Test Pilots School offers the following short courses that provide effective customer focused training solutions, the latest in aerospace technology and best practices from an international team of world class experts for fixed and rotary wing, civil and military training.

The schedule below provides an overview of available of short courses and start dates for 2020. For all other courses kindly contact ITPS for more information together with our standard terms and conditions. We regularly tailor courses and design courses to a client's requirement in content and/or aircraft.

The prices quoted are for attendance only, they do not include air fare, accommodation or transportation to and from the school. For assistance with the above or a complete package quote, kindly contact the school.

The ITPS website will have the latest schedule for 2020 and be regularly updated. In general payments are due on booking invoice and we apply cancellation fees on all our courses. Course costs and start dates are subject to change without notice.

Short Course Schedule

	Weeks	Flight Hours	Jan 2020	June-> 2020	Course Cost USD* Pilot or FTE
Introduction to Fixed Wing Flight Tests (Academics)	3	5.0	11-May	13 Oct-	$9,600
Fixed Wing Performance Flight Tests (Academics)	2	-	25-May	22 June	$4,800
Optional extra flying weeks on demand	On demand		-		
Fixed Wing Flying Qualities Flight Tests (Academics)	2	-	-	10 Aug	$4,800
Optional extra flying week on demand	On demand		-		$10,700
Digital Flight Control Systems Testing	2	-	-	26 Oct	$4,800
Optional extra simulator week	1				$10,700
Rotary Wing Performance Flight Tests (Academics)	2	-	25-May	27 Sept	$4,800
Optional extra flying weeks on demand	On demand			13 Oct	$10,700
Rotary Wing Flying Qualities Flight Tests (Academics)	2	-	-	16 Nov	$4,800
Optional extra flying weeks on demand	On demand		-	30 Nov	$10,700
(Civil) Avionics Systems Flight Tests (Academics)	1	-	3-Feb	14 Sept	$2,500
Optional extra flying week	1	4.0	10-Feb		$10,700
Introduction to Unmanned Aircraft Systems Flight Testing	2	-	13-Apr	13 Oct	$6,000
				23 Nov	
Operational Test & Evaluation Course	3	4.0		13 Oct-	$11,000

On Demand Courses**

	Weeks	Flight Hours	Jan 2020	June 2020	Course Cost USD* Pilot or FTE
Flight Test Certificate course	6	12.0		13 Oct	$85,500
Flight Test Certificate course	3	6.0		13 Oct	$15,000
Stores Certification & Weapons Testing	2	-		TBC	$11,000
(Military) Avionics Systems Flight Tests	4	-		TBC	$23,500

* Prices quoted in US Dollars.
** ITPS will run these courses subject to minimum number of students at its discretion.
**Course dates will be confirmed on application by students.
*** Digital copy of Lecture notes will be provided.

Please refer to the ITPS website for the latest schedule for 2020/2021.
In general payments are due on booking invoice and we apply cancellation fees on all our courses.
Course costs and start dates are subject to change without notice.

International Test Pilots School

INTRODUCTION TO FIXED WING FLIGHT TESTS

COURSE OUTLINE

OBJECTIVES: This course provides the minimum knowledge to understand what Flight Testing is and gives a practical exposure to fixed wing aircraft flight tests. The course includes flight exercises on two aircraft types. Instruction focuses on risk assessment, test planning, techniques used to prepare the test cards, standard procedure to brief the test points, and demonstrates flight test methods, data acquisition and analysis. Students will participate as crew in recording data in flight in one of ITPS instrumented laboratory aircraft. A tutorial session after each flight will guide the students through the data analysis process to reduce the data. Students will gain an understanding of the flight test process from planning to execution, analysis and reporting for flight test purposes with reference to both civil and military specifications.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Flight Test;
2. Test Plan Preparation;
3. Flight Safety and Risk management
4. Test Card Preparation;
5. Report Writing;
6. Anthropometrics and Ergonomics;
7. Flight Test Instrumentation;
8. Gas Properties and International Standard Atmosphere (ISA);
9. Fixed Wing Performance Test Techniques;
10. Fixed Wing Performance Data Analysis;
11. Equations of Motion and Aerodynamic Derivatives;
12. Fixed Wing Flying Qualities Test Techniques;
13. Fixed Wing Flying Qualities Data Analysis;
14. Military Specifications;
15. CS25 Certification Process.

START DATE **12 October 2020**

DURATION: Three weeks.

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): ITPS Report Writing, Performance and Flying Qualities Flight Test Manual.

REFERENCES: *Flight Testing of Fixed-Wing Aircraft (AIAA Education) Ralph D. Kimberlin ISBN: 1563475642 Introduction to Flight Test Engineering by Donald T. Ward published by Elsevier Science Ltd (June 1993) ISBN: 0444881476*

PRACTICAL/LAB: 5.0 flight hours (total) of test techniques demonstration.

AIRCRAFT:

- Cirrus SR-22 (single engine propeller) - 3 students per flight and/or
- Duke B60 (twin engine propeller) – 4 students per flight

EVALUATION None.

INSTRUCTORS: *Andre Celere Ph.D., Panos Vitsas Ph.D., Fred Hauviller MSc.*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

FIXED WING PERFORMANCE FLIGHT TESTS

COURSE OUTLINE

OBJECTIVES: This course provides an overview of fixed wing aircraft performance flight tests referring to both propeller and jet engine aircraft. The main performance subjects are covered including take-off and landing performance, climb, descent, cruise and maneuvering flight. The course includes a mixture of theoretical lectures and tutorials/workshops where students create performance models. Instruction focuses on flight test methods, test planning, data acquisition and analysis. Participants are also introduced to civil specification for fixed aircraft (CS23/25), military specifications and methods of demonstrating compliance when testing a new or modified aircraft.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Flight Test;
2. Gas Properties and International Standard Atmosphere (ISA);
3. Air Data and Pressure Error Correction;
4. Thrust and Drag Equations;
5. Stall Speed;
6. Take-off and Landing Performance;
7. Range and Endurance;
8. Climb and Descent Performance,
9. Manoeuvre Performance.

START DATE **22 June 2020**

DURATION: Two weeks (optional extra flying week(s) on demand).

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): ITPS Fixed Wing Performance Flight Test Manuals.

REFERENCES: *Flight Testing of Fixed-Wing Aircraft (AIAA Education) Ralph D. Kimberlin ISBN: 1563475642 Introduction to Flight Test Engineering by Donald T. Ward published by Elsevier Science Ltd (June 1993) ISBN: 0444881476*

PRACTICAL/LAB: Flights and simulator on demand (prices quoted separately).

AIRCRAFT:

- Cirrus SR-22 (single engine propeller) - 3 students per flight and/or
- Duke B60 (twin engine propeller) – 4 students per flight

EVALUATION *None for short course students.*

MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D., Panos Vitsas Ph.D., Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

FIXED WING FLYING QUALITIES FLIGHT TESTS
COURSE OUTLINE

OBJECTIVES: This course provides an overview of fixed wing aircraft flying qualities flight tests. Instruction focuses on flight test methods, test planning, data acquisition and analysis. The main stability and control and handling qualities subjects are covered including longitudinal, lateral, directional static and dynamic stability, roll performance, stall characteristics and spinning and closed loop handling qualities. Participants are introduced to both military and civil specification for fixed wing aircraft (CS23/25) aircraft and methods of demonstrating compliance when testing a new or modified aircraft.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Flight Test;
2. Reference Systems, Aircraft Modes of Motion and Aerodynamic Derivatives;
3. Flight Control Mechanical Characteristics;
4. Longitudinal Static Stability;
5. Longitudinal Manoeuvres Stability;
6. Longitudinal Dynamic Stability;
7. Lateral and Directional Static Stability;
8. Lateral and Directional Dynamic Stability;
9. Rolling Performance;
10. Asymmetric Power Flight;
11. Stall and Spinning;
12. Aeroelasticity and Flutter;
13. Closed-loop Handling Qualities.

START DATE **10 August 2020**

DURATION: Two weeks (optional extra flying week(s) on demand).

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): ITPS Report Writing, Performance and Flying Qualities Flight Test Manual.

REFERENCES: *Flight Testing of Fixed-Wing Aircraft (AIAA Education) Ralph D. Kimberlin ISBN: 1563475642 Introduction to Flight Test Engineering by Donald T. Ward published by Elsevier Science Ltd (June 1993) ISBN: 0444881476*

PRACTICAL/LAB: Flights and simulator on demand (prices quoted separately).

AIRCRAFT:

- Cirrus SR-22 (single engine propeller) - 3 students per flight
  and/or
- Duke B60 (twin engine propeller) – 4 students per flight

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D., Panos Vitsas Ph.D., Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

DIGITAL FLIGHT CONTROL SYSTEMS TESTING

COURSE OUTLINE

OBJECTIVES: The Digital Flight Control Systems Testing Course addresses digital flight control systems design, testing and certification with specific reference to applicable military specifications including MILSTD-1797, ADS-33E PRF and case studies of civil airliner certifications in accordance with FAR Part 25 requirements. Students are taught Pilot Induced Oscillation (PIO) detection methods and have the unique opportunity to identify and experience them in the ITPS engineering simulator. Students will gain the fundamental knowledge and experience to be able to interact with flight control systems engineers on test programs.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Math and Stability and Control Review;
2. Flying Qualities Requirements;
3. Feedback Control Systems
4. Laplace, Frequency Domain and Dynamic Elements;
5. Root-Locus;
6. Compensators and Nonlinearities;
7. Testing Modern Airplanes;
8. Rating Scales;
9. Pilot Induced Oscillations – Airplane Pilot Coupling;
10. Simulation Usage;
11. Design for Flying Qualities: MIL-STD, FARs;
12. FBW Flight Test;
13. System Performance;
14. Multi-axis Methods and Advances in Flight Control;
15. System Identification;
16. CS25 Transport Category Aircraft Cases study

START DATE 26 October 2020

DURATION: Two weeks (optional extra flying week on demand).

CONTACT HOURS: 35 Lecture hours of academic lectures and tutorials

TEXTBOOK(S): ITPS Report Writing, Performance and Flying Qualities Flight Test Manual.

REFERENCES: *MIL-HDBK-1797 HANDBOOK FLYING QUALITIES OF PILOTED AIRCRAFT*
FAR Part 25: Airworthiness Standards: Transport category airplanes.

PRACTICAL/LAB: 4.0 hours of test techniques demonstration/data engineering simulator sessions
AIRCRAFT: (optional extra 2.0 flight hours DFCS evaluation Airbus A320 Full Motion Simulator)

- ITPS F-16/F-35 Engineering Simulators
- Airbus A320 FMS

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D., Panos Vitsas Ph.D., Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

ROTARY WING PERFORMANCE FLIGHT TESTS
COURSE OUTLINE

OBJECTIVES: This course provides an overview of rotary wing aircraft performance flight tests. The main performance subjects are covered, starting with rotor performance theory, and passing through the helicopter flight phases including hover, vertical climb, level flight, climbs and descents. The engine performance and Engine and Rotor Governing assessment (ERGA) are also covered. The course includes a mixture of theoretical lectures and tutorials/workshops where students create their data reduction template files for their subsequent flight exercises, using real flight data examples. Instruction focuses on flight test methods, test planning, data acquisition and analysis. Participants are also introduced to civil specification for rotary wing aircraft (CS27/29), military specifications and methods of demonstrating compliance when testing a new or modified aircraft.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Flight Test;
2. Gas Properties and International Standard Atmosphere (ISA);
3. Air Data and Pressure Error Correction;
4. Engine and Rotor Governing Assessment;
5. Engine Performance;
6. Rotor Theory;
7. Hover Performance;
8. Vertical Climb Performance;
9. Climb and Descent Performance;
10. Level Flight Performance;

START DATE **27 September 2020**

DURATION: Two weeks (optional extra flying week(s) on demand

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): ITPS Rotary Wing Performance Flight Test Manual.

REFERENCES: *Helicopter Performance, Stability, and Control, Raymond W. Prouty, Revised Edition, Published June 1995* ISBN: 0894649299

PRACTICAL/LAB: AIRCRAFT: Flights and simulator on demand (prices quoted separately).

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Joao Falcao MSc., Adam Lowes MSc, Cedric Danancher MSc.*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

ROTARY WING FLYING QUALITIES FLIGHT TESTS

COURSE OUTLINE

OBJECTIVES: This course provides an overview of rotary wing aircraft flying qualities flight tests. The main stability and control subjects are covered through the review of helicopter static and dynamic stability (longitudinal, lateral and directional), including low speed regime, aerodynamic derivatives and rotor dynamics. The principles and sources of helicopter vibration are also covered. Specific flight test lectures are included for flight controls mechanical characteristics (FCMC), autorotation and helicopter category A operations. Instruction focuses on flight test methods, test planning, data acquisition and analysis. The course includes a mixture of theoretical lectures and tutorials/workshops where students are presented to the flight test techniques using simulation tools. Participants are also introduced to civil specification for rotary wing aircraft (CS27/29), military specifications, specially ADS-33E-PRF, and methods of demonstrating compliance when testing a new or modified aircraft.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Flight Test;
2. Reference Systems, Aircraft Modes of Motion and Aerodynamic Derivatives;
3. Flight Control Mechanical Characteristics;
4. Rotor Dynamics;
5. Longitudinal Static Stability;
6. Longitudinal Manoeuvre Stability;
7. Longitudinal Dynamic Stability;
8. Lateral and Directional Static Stability;
9. Lateral and Directional Dynamic Stability;
10. Low Speed;
11. Handling Qualities;
12. Helicopter Vibration;
13. Autorotation;
14. Category A Operations

START DATE **16 November 2020**

DURATION: Two weeks (optional extra flying week(s) on demand).

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): ITPS Rotary Wing Flying Qualities Flight Test Manual

REFERENCES: *Helicopter Performance, Stability, and Control, Raymond W. Prouty, Revised Edition, Published June 1995* ISBN: 0894649299

PRACTICAL/LAB: AIRCRAFT: Flights and simulator on demand (prices quoted separately).

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Joao Falcao MSc., Adam Lowes MSc, Cedric Danancher MSc.*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

(CIVIL) AVIONICS SYSTEMS FLIGHT TESTS
COURSE OUTLINE

OBJECTIVES: The Avionic Systems Flight Test module introduces students to the fundamental principles of operation of key aircraft avionic systems and then focuses on how these systems are tested to determine compliance with civil certification requirements. The civil certification process as applicable to avionic systems is covered in detail. Students are also introduced to anthropometric standards and ergonomic concepts in flight deck design and the applicable regulatory, guidance materials and recommended methods of demonstrating compliance when testing a new or modified avionic systems are presented.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. Introduction to Avionics Flight Testing;
2. Anthropometrics and Ergonomics;
3. Civil certification;
4. Avionics Software
5. Computing and Integration;
6. Electromagnetic Spectrum and Communication;
7. Attitude Heading and Reference Systems;
8. Gyroscope;
9. Inertial Navigation (IN) Systems;
10. Global Positioning System (GPS);
11. Navigation sensors;
12. Autopilots;
13. Vision Systems;
14. Electronic Flight Information Systems;
15. Flight Management Systems (FMS);
16. Traffic Avoidance and Collision Systems (TCAS), Terrain Avoidance Warning System (TAWS), Enhanced/Ground Proximity Warning Systems (EGPWS) Radar testing.

START DATE **14 September 2020**

DURATION: Two weeks.

CONTACT HOURS: 35 Lecture hours of academic lectures and tutorials

TEXTBOOK(S): ITPS Avionics Flight Test Manual.

REFERENCES: *Test and Evaluation of Aircraft Avionics and Weapon Systems, Robert E. McShea, 2nd Edition, Published Sep 2014, ISBN: 1613531761*

PRACTICAL/LAB: 4.0 flight hours (total) of test techniques demonstration.

AIRCRAFT: 3.0 hours of cockpit ergonomics evaluation (simulator or static aircraft).

- Cirrus SR-22 (single engine propeller) - 3 students per flight
- Duke B60 (twin engine propeller) – 4 students per flight
- F-18 / F-35 Engineering Simulator or B787 Simulator

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D. Panos Vitsas Ph.D. Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

STORES CERTIFICATION AND WEAPONS TESTING

COURSE OUTLINE

OBJECTIVES: This course provides an overview of the aircraft Stores Certification process as defined in MIL-HDBK-1763 Stores Certification. Students are provided with an introduction to fighter aircraft weapons as a foundation to the weapon testing aspects. The Handbook defined Ground tests and flight tests leading up to captive carriage and Safe Release flights are described with an emphasis on how to plan and execute test safely and efficiently, data acquisition and analysis requirements and methodologies. The course also addresses Weapon System testing from the Man Machine Interface point of view. The Combat Aircraft Engineering Simulator will be used to provide practical exposure to the test methods presented. Delegates upon completion of this course will have a thorough preparation allowing them to participate in Stores Certification and Weapons testing of any combat aircraft type.

PREREQUISITES: TPS graduates or have similar background.

TOPICS:

1. Introduction to MIL-HDBK-1763;
2. Stores Certification Process;
3. Engineering Analysis;
4. Test Requirements and Planning;
5. Stores Ground Tests;
6. Stores Flight Tests;
7. Data Analysis.

START DATE **On demand**

DURATION: Two weeks.

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): -

REFERENCES: *MIL-HDBK-1763 Stores Certification.*

PRACTICAL/LAB: F-18 / F-35 / B787 Engineering Simulator
AIRCRAFT: Telemetry Control Room Exercise

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D. Panos Vitsas Ph.D. Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

INTRODUCTION TO UAS FLIGHT TESTING
COURSE OUTLINE

OBJECTIVES: This course provides a solid grounding in UAS technology, flight operations and the principles and techniques of UAS flight test. The course focus on providing training in the discipline of UAS flight testing, management and reporting, and gives practical experience of UAV flight tests and flight test management thorough preparation in UAV test techniques and test aspects for the associated sensors and systems.

PREREQUISITES: Graduate student standing or permission from the instructor

TOPICS:

1. UAS Fundamentals and Introduction to UAS Flight Test
2. UAS Regulations and Military Standards
3. UAS Ground Testing
4. Human Machine Interface (HMI) & Evaluation
5. Datalinks and C2
6. Payloads
7. Performance, Flying Qualities and Flight Control Testing
8. Powerplant Testing
9. UAS Test Planning & Risk Management

START DATE 13 Ocober & 23 November 2020

DURATION: Two weeks.

CONTACT HOURS: 50 Lecture hours of academic lectures and tutorials

TEXTBOOK(S): -

REFERENCES: *STANAG 4671: UAV System Airworthiness Requirements (USAR), AGARD: RTO- AG-SCI-105 - 'Unique Aspects of Flight-Testing Unmanned Aircraft System.*

PRACTICAL/LAB: 6.0 flight hours (total) of UAV test techniques demonstration
AIRCRAFT: 3.0 hours of Ground Control Station ergonomics evaluation (UAV simulator)

ITPS UAV fleet

EVALUATION *None for short course students.*
MSc students only: The final course grade will be determined as listed below:

- *Exam 40%*
- *Lab Exercises 30%*
- *Flight Test Report 30%*

INSTRUCTORS: *Andre Celere Ph.D., Panos Vitsas Ph.D., Joao Falcao MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

OPERATIONAL TEST & EVALUATION
COURSE OUTLINE

OBJECTIVES: The course provides a solid grounding in the principles of flight test, coupled to an understanding of key concepts of OT&E and its associated processes. The OT&E course focuses on explain the philosophy of Operational Test and Evaluation and provide an introduction to the performance, stability and control, handling qualities and systems measurement flight tests. Additionally, maintainability and reliability, cockpit ergonomics and assessment, workload are concepts also discussed and contextualized to OT&E and its associated processes.

PREREQUISITES: No minimum admission requirements. Candidates should preferably be experienced operational pilots or graduate engineers with military or industry experience.

TOPICS:

1. Introduction to Flight Testing and OT&E
2. Flight Safety and Risk management
3. Test and Evaluation Master Plan;
4. Test Card Preparation;
5. Report Writing;
6. Anthropometrics and Ergonomics;
7. Acquisition, T&E Processes;
8. Introduction to DT&E;
9. Documentation;
10. Integrated Testing;
11. DT&E support for technical reviews and Milestone decisions;
12. Fixed Wing Performance Test Techniques;
13. Fixed Wing Flying Qualities Test Techniques;
14. Digital Flight Control System;
15. Avionics Systems Tests;
16. Reliability, Availability and Maintainability;

START DATE 12 October 2020

DURATION: Three weeks.

CONTACT HOURS: 60 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S): -

REFERENCES: -

PRACTICAL/LAB: 4.0 flight hours (total) of test techniques demonstration

AIRCRAFT: 3.0 hours of cockpit ergonomics evaluation (simulator or static aircraft)
4.0 hours of test techniques demonstration/data engineering simulator sessions

- Cirrus SR-22 (single engine propeller) - 3 students per flight
- Duke B60 (twin engine propeller) – 4 students per flight
- B206 (single engine helicopter) – 3 students per flight
- BO105 (twin engine helicopter) – 3 students per flight
- F-18 / F-35 Engineering Simulator

EVALUATION *None for short course students.*

INSTRUCTORS: *Andre Celere Ph.D. Panos Vitsas Ph.D. Stephane Logette MSc, Adam Lowes MSc, Cedric Danancher MSc.*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

International Test Pilots School

FLIGHT TEST CERTIFICATE COURSE
COURSE OUTLINE

OBJECTIVES:

The proposed course is a specially tailored six weeks course and is focused on preparing an experienced test crew to undertake development and certification flight tests on a new transport category aircraft. Accordingly, the program focuses on first flight planning and execution, development flight tests including Envelope expansion, early Stall Speed determination, minimum speeds determination, stall characteristics and high-speed characteristics as well as selected Performance measurement flight tests. Flying qualities tests focus on multi-engine, transport category aircraft. The practical flight test exercises are focused on teaching and practicing flight test methods. The program includes a simulated first flight on an unfamiliar aircraft. Graduates of the program will be equipped with a thorough understanding of the Civil Certification processes (FAA, TC and EASA). They will also gain an understanding and experience of the applicable flight test methods, data analysis and report writing.

PREREQUISITES:

Pilot: Minimum 400 hours as Pilot in Command, minimum 1,000 hours total. Valid Commercial Pilot license with Multi-Engine and Instrument Ratings.

Engineer: Engineering Diploma/Degree.

TOPICS:

1. Flight Safety and Risk Management;
2. CS25 Certification Process;
3. (Recap) Fixed Wing Performance and Flying Qualities Test Techniques and Data Analysis;
4. Advanced Fixed Wing Performance and Flying Qualities Test Techniques
   - Stalls;
   - OEI Testing;
   - Dynamic Manoeuvres;
   - Envelope Expansion;
   - High Speed Testing;
   - HQRM and Closed-Loop Handling Qualities;
5. First Flight;

START DATE

12 October 2020

DURATION:

Six weeks.

CONTACT HOURS:

120 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S):

REFERENCES:

Flight Testing of Fixed-Wing Aircraft (AIAA Education) Ralph D. Kimberlin ISBN: 1563475642.
Introduction to Flight Test Engineering by Donald T. Ward published by Elsevier Science Ltd (June 1993) ISBN: 0444881476.

PRACTICAL/LAB:

12.0 flight hours (total) of test techniques demonstration;
3.0 hours of cockpit ergonomics evaluation (simulator or static aircraft)
3.0 hours of test techniques demonstration/data F-18 / F-35 / B787 Engineering Simulator.

AIRCRAFT:

- Cirrus SR-22 (single engine propeller) - 3 students per flight
- Duke B60 (twin engine propeller) – 4 students per flight
- F-18 / F-35 / B787 Engineering Simulator

EVALUATION

None for short course students.

INSTRUCTORS:

Andre Celere Ph.D. Panos Vitsas Ph.D. Stephane Logette MSc

CONTACT:

Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

(MILITARY) AVIONICS SYSTEMS FLIGHT TESTS
COURSE OUTLINE

OBJECTIVES: This course focuses on avionics systems and their application in the context of a modern combat aircraft developmental flight test program. The course commences with the ergonomics and man-machine interface considerations for modern fighter cockpits, assessment methods for modern integrated fighter avionics systems. The importance of focusing on mission suitability by setting up relevant, mission-oriented tasks whilst building an understanding of cockpit workload and suitability testing in current generation fighters. Additionally, this course addresses the physical principles of electro-optical sensors and devices, their necessity for airborne night operations and the engineering solutions to render the aircraft cockpit compatible with Night Vision Goggles. Methods to ensure the compatibility of cockpit lighting with NVGs and test and evaluation methods in accordance with industry best practice.

PREREQUISITES: TPS graduates or have similar background.

TOPICS:

1. Introduction to Avionics Systems Flight Testing;
2. Anthropometrics and Ergonomics;
3. Fighter Cockpits;
4. Avionics Software;
5. Computing and Integration
6. Displays, HDD, HUD and HMDs;
7. Electromagnetic Spectrum and Communication;
8. Inertial Navigation Systems;
9. Navigation Sensors;
10. Radar;
11. Electro-optics (FLIR and NVG);
12. Sensor fusion;
13. Electronics Warfare Testing

START DATE **On demand**

DURATION: Four weeks.

CONTACT HOURS: 70 Lecture hours of academic lectures and tutorials.

TEXTBOOK(S):

REFERENCES: *Test and Evaluation of Aircraft Avionics and Weapon Systems, Robert E. McShea, 2nd Edition, Published Sep 2014, ISBN: 1613531761*

PRACTICAL/LAB: 6.0 hours of test techniques demonstration engineering simulator;
AIRCRAFT: 3.0 hours of cockpit ergonomics evaluation (simulator or static aircraft);
3.0 hours of NVIS evaluation (on ground);
2.0 hours of FLIR evaluation (on ground).

- F-18 / F-35 Engineering Simulator

EVALUATION *None for short course students.*

INSTRUCTORS: *Andre Celere Ph.D. Panos Vitsas Ph.D. Stephane Logette MSc*

CONTACT: Accountable Manager - Approved Training Organization Giorgio Clementi - g.clementi@itpscanada.com - Tel: 519 457-3625 Office: 2410 Blair Boulevard, London, ON, N5V 3Z9

ITPS
CANADA

2410 Blair Boulevard
London, Ontario
N5V 3Z9, Canada

tel: +1 (519) 457-3625
fax: +1 (519) 457-3627
info@itpscanada.com