

# Instrument Flight Training Syllabus

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## INTRODUCTION

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The following pages outline our program of Instrument Rating Training. Our suggested program of Ground, Synthetic (Simulator) and Flight Training is designed for the candidate to attain the level of competency required by Transport Canada for the issue of a Group 4 (Helicopters) Instrument Rating.

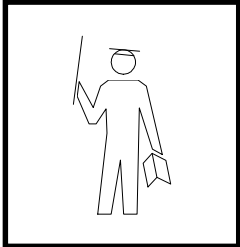
When reviewing the information in this syllabus, please note the following:

- The suggested times are minimum times only for the initial issue of an Instrument Rating. These times may be modified to allow for student experience and progress. Times shown include estimates of required classroom briefings, tutoring sessions and self study.
- For the purposes of scheduling, we normally spend no more than 2 hours daily in formal briefings, and usually only one “flight” per day when flying training commences. We have determined that student receptivity drops sharply beyond this time frame. The remainder of the day is to be spent on self study, review of computer exercises, homework assignments and exams.
- It is expected that the student is entering the course with a valid CPL(H) and has a basic threshold level of knowledge in the areas of VFR navigation, CARs, and Meteorology. If any of these areas are weak, then additional review and pre-study time must be allocated in order to get the most out of the IFR syllabus.
- Lectures on Human Factors will be included in the Ground Syllabus to broaden the candidate’s knowledge of the impact of these factors during Instrument Flight. The Human Factors for Aviation - Basic Handbook, and Part 1 of the Canadian Instrument Procedures Manual are the recommended references.
- Student progress will be closely monitored both on the ground and in the air. Any weak areas noted will require additional practice prior to the recommendation for a flight test.
- Radio procedures will also be practised during the training. This includes position reporting during the cross country stage.

Heli-College Canada Training Inc. wishes to acknowledge the assistance of Transport Canada, numerous flying organizations, and other individuals that provided assistance in the preparation of this syllabus of training.

# Instrument Flight Training Syllabus

## GROUND TRAINING

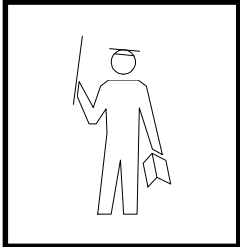


### Course Outline

Lesson Plan	Time	Subject
<b>REGS 400</b>	3.0 hours	Introduction
	3.0 hours	VFR Review, IFR Regulations
<b>INST 400 (a)</b>	4.0 hours	Flight Planning — General
	4.0 hours	Departures
	4.0 hours	Enroute
	4.0 hours	Arrivals
	4.0 hours	Approaches
	4.0 hours	Emergencies
<b>INST 200</b>	8.0 hours	Flight Instruments
<b>NAVI 300</b>	8.0 hours	Navigation Instruments & Equipment
	2.0 hours	Compasses
	2.0 hours	Other Navigation Equipment in Use
<b>INST 220</b>	8.0 hours	Basic Attitude Instrument Flying
<b>METR 300</b>	5.0 hours	Introduction to IFR Meteorology
	3.0 hours	Air Masses
	3.0 hours	Cold Fronts
	3.0 hours	Warm Fronts
	3.0 hours	Thunderstorms
	3.0 hours	Icing, Turbulence, Fog
<b>METR 400</b>	2.5 hours	Weather Charts
	2.5 hours	Weather Reports
	2.5 hours	Weather Planning
	2.5 hours	Review & Discussion
<b>INST 400 (b)</b>	4.0 hours	IFR Flight Planning
	4.0 hours	Computer Problems
	4.0 hours	General Navigation Exercise
	4.0 hours	Cross Country Exercise (Flight Planning Only)
<b>Practice Exams</b>	6.0 hours	
<b>TOTAL</b>	<b>approximately 90.0 hours</b>	

# Instrument Flight Training Syllabus

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## Introduction

3.0 hours

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- Objective of Course
- Air Traffic Control Services - History, Services Provided, Description of Ground, Tower, Terminal, Departure, Arrival, ACC's
- ICAO - History , Organization, Method of Disseminating Information, Compliance
- Definitions
- Characteristics of Airspace, Airways and Routes
- Medical and Physiological Factors

## VFR Review, IFR Regulations

3.0 hours

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- VFR / IFR - Weather Minima, Flight Planning, Pilot, Aircraft & Fuel Requirements, Communications
- SVFR - Weather Minima, Flight Planning, Authority
- DVFR - General, Domestic, Coastal, Dewiz, ADIZ, ESCAT Requirements & Compliance
- Cruising Altitudes
- Standard Pressure Region
- Sparsely Settled Areas and Mountainous Regions

## Flight Planning General

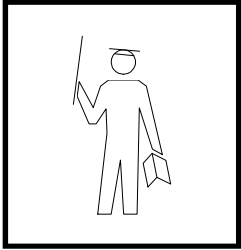
4.0 hours

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- Pilot, Aircraft and Weather Requirements for Operating under IFR conditions
- CAP Plates, LO and HO Charts, Flight Supplement
- Route Planning
- Flight Logs
- Flight Plans
- Preferred Routing
- Notams
- Use of ICAO Flight Plan

# Instrument Flight Training Syllabus

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## Departures

4.0 hours

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- ATIS
- Checks
- Clearances - Clearance limit
- Departures - SID
- Departures - Published and Standard
- Departures - uncontrolled airports
- Departure Procedures - mountainous regions
- Obstacle and terrain clearance requirements

## En Route

4.0 hours

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- Radar & Non Radar
- MEA, MOCA, MFPA, MRA, MRVA, AMA
- Clearance Limits - Holding
- Altitude Changes
- Position Reporting
- Intersections
- Turning Points
- Activity, Military Flying Areas, and Restricted Areas

## Arrival

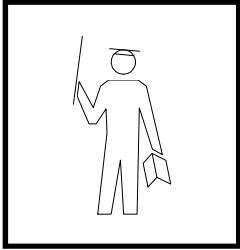
4.0 hours

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- Clearances
- Terminal
- Controlled Airports, Uncontrolled aerodromes
- Radar & Non Radar
- Airports with no Tower
- Holding
- Information Required by Pilot

# Instrument Flight Training Syllabus

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## Approaches

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4.0 hours

- Clearances
- Approach charts
- Approach and runway lighting
- STARS
- Transitions
- Radar and non radar
- ILS and ILS/DME approaches
- LOC (BC) approaches
- NDB approaches
- VOR approaches
- DME ARC
- Missed approaches
- CAT II and III ILS

## Emergencies

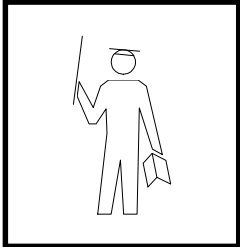
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4.0 hours

- Departure, Enroute, Arrival
- Communications Failure
- Navigation Equipment Failure
- Flight Instruments Failure
- System Failures
- Engine Failure
- 121.5
- Hijacking
- ELT usage
- SIGMETs

# Instrument Flight Training Syllabus

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## **Flight Instruments**

**8.0 hours**

- Attitude Indicator - Principles of Operation, Limitations, Failures
- Heading Indicator - Principles of Operation, Limitations, Precession, Failure
- Turn and Slip - Principles of Operation, Rates of Turn, Failures
- Turn Co-ordinator - Principles of Operation, Rates of Turn, Failures
- Vertical Speed Indicator - Principles of Operation, Limitations, Failure, IVSI
- Airspeed Indicator - Principles of Operation, Limitations, Failure, Pitot Heat, Mach
- Altimeter - Principles of Operations, Limitations, Failure, Types
- Flight Director - Principles of Operation, Limitations, Failures
- Horizontal Situation Indicator - Principles of Operation, Limitations, Failures

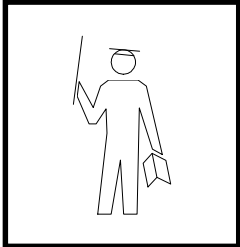
## **Navigation Instruments & Equipment**

**8.0 hours**

- VOR / VOT — Principles of Operation, Limitations, Failure, Identification, Frequencies, Equipment Checks on VOT
- ADF — Principles of Operation, Limitations, Identification, Radio Stations, Power, Frequency Range, Fixed Card & RMI
- ILS — Principles of Operation, Limitations, Identification, Frequency Band, Components of System, Localizer Only, Track Guidance Localizer
- DME — Principles of Operation, Limitations, Identification, Use of TACAN DME and frequency pairing chart
- GNSS — Principles of Operation, Limitations, GPS, GLONASS, GALILEO systems, RAIM prediction, FDE
- TRANSPONDER — Principles of Operation, Limitations, Use, Altitude Reporting, Modes of Operation

# Instrument Flight Training Syllabus

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## **Compasses** **2.0 hours**

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- Magnetic Compass — Principles of Operation
- Errors - Variation, Deviation, Dip Tolerances and Unserviceabilities, Swinging - Frequency & Procedures
- Gyro Compass — Principles of Operations
- Errors, Tolerances & Unserviceabilities
- Slaving systems

## **Other Navigation Equipment in Use** **2.0 hours**

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- INS
- LORAN C
- DOPPLER
- AREA NAV (RNAV)
- TACAN
- VHF/DF Steer
- PAR

## **Basic Attitude Instrument Flying** **8.0 hours**

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- Attitude Instrument Flying Techniques
- Scan patterns
- Primary and secondary instruments
- Timed turns and Training patterns
- Unusual Attitudes
- Partial Panel

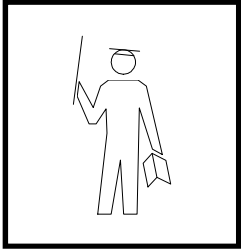
## **Meteorology Introduction** **5.0 hours**

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- History of Weather Services
- Temperature, Pressure, Moisture
- Clouds, Precipitation
- Visibility, Wind

# Instrument Flight Training Syllabus

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## **Air Masses**

**3.0 hours**

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- Description
- Types of Air Masses Normal in Summer and Winter
- Characteristics
- Stability & Moisture
- Modification
- Fronts
- Trowals

## **Cold Fronts**

**3.0 hours**

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- Description
- Factors Governing Frontal Weather
- Surface Winds
- Temperature
- Moisture
- Cloud & Precipitation
- Visibility
- Pressure
- Upper Cold Fronts

## **Warm Fronts**

**3.0 hours**

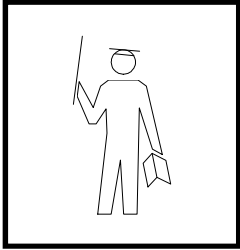
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- Description
- Factors Governing Frontal Weather
- Surface Winds
- Temperature
- Moisture
- Cloud & Precipitation
- Visibility
- Pressure
- Upper Warm Fronts



# Instrument Flight Training Syllabus

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## **Thunderstorms (CBs)**

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**3.0 hours**

- Description
- Stages & Types
- Surface Weather
- Inflight Weather Conditions
- Flight Through a Thunderstorm
- Precautions in Vicinity and Avoidance

## **Icing, Turbulence, Fog**

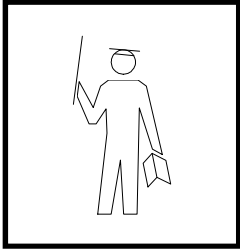
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**3.0 hours**

- Turbulence
  - Mechanical
  - Thermal
  - Frontal
  - Wind Shear
  - Flight Precautions
- Icing
  - Formation
  - Types
  - Airframe
  - Engine
  - Rotor System
  - Flight Precautions
- Fog
  - Types
  - Formation
  - Dissipation
- Clear Air Turbulence
- Mountain Waves

# Instrument Flight Training Syllabus

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## Charts

2.5 hours

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- Upper Level (PROG and ANAL)
- Surface charts
- Symbols
- Frequency of issue
- Specialty Charts

## Weather Forecasts and Reports

2.5 hours

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- Aviation Weather Forecasts (TAFs)
  - Frequency
  - Description
  - Information Available
- Aviation Weather Reports (Metars)
  - Frequency
  - Description
  - Information Available
- GFAs
- Notams, UAs, FDs, SDs
- Symbols

## Weather Planning

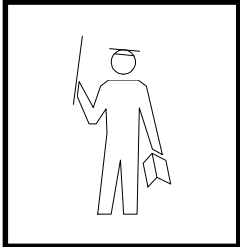
2.5 hours

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- Information to give Flight Service and When
- Information to be Obtained From Flight Service
- Route Forecasts
- Altitude Planning
- Destination and Alternate Planning
- Cloud
- Turbulence
- Icing
- Winds

# Instrument Flight Training Syllabus

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## **Review and Discussion**

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**2.5 hours**

- General Review and Discussion
- Workshop Problems

## **IFR Flight Planning**

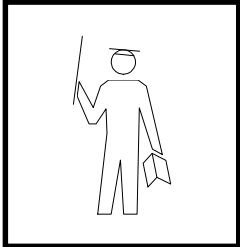
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**4.0 hours**

- Weather & Notams
- Flight Log
  - Routing to Destination & Alternate
  - Altitudes, (MEA, MRA, MOCA, MRVA, MFPA, MSA, SA100 NM, CRUISE ALTITUDE)
  - Track
  - Heading
  - Airspeed (IAS, CAS, EAS, TAS, MACH)
  - Reporting Points, Altitude changes
  - Changeover Points
- Flight Plan
  - Completing
  - Filing
- Equipment
  - Pilot
  - Aircraft
  - Departure, Enroute, Arrival, Approach
- Slot Times at Busy Airports
- Filing Into Prior Permission Airports
- Filing to Other Countries

# Instrument Flight Training Syllabus

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## **Flight Computer Problems** **4.0 hours**

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- Description
- Proportion
- Time, Speed, Distance
- Fuel
- Statute, Nautical Miles & Kilometres
- Airspeed & Altimeter Corrections
- Heading & Ground Speed
- Wind Direction & Speed
- Point of No Return
- Critical Point

## **General Navigation Problems** **4.0 hours**

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- Short Cross Country with given winds, etc. for navigation planning Purposes Only

## **Flight Planning Exercises** **10.0 hours**

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- Full X-CTRY Using Prepared Weather Forecasts, Sequences and Routings Prevalent During the Period of Time Laid Down in the Exercise

### **NOTE :**

Common LO Charts will have to be obtained when preparing these exercises.

## **Practice Exams** **10.0 hours**

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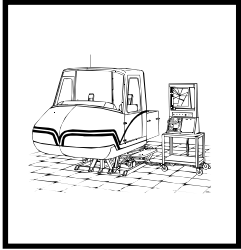
These examinations, are prepared by the school in a similar format to the Transport Canada INRAT Examination, in order to provide students with a measure of their level of knowledge. Where a multiple choice type exam has been prepared, care has been taken to provide an exam which will allow an in depth probe of the students knowledge. Combination multiple choice and direct answer papers in each sub-section are also available during the training course.

# Instrument Flight Training Syllabus

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## SIMULATOR FLIGHT TRAINING

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### Basic Instrument Review

2.0 hours

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- Use of Flight Instruments
- Recognition of attitudes
- Straight and level flight
- Climbing, Descending
- Turns
- Climbing turns, Descending turns
- Recovery from unusual attitudes

### NOTES

Sequences will be completed using both partial (limited) and full instrument panel.

Allocated time should be used as basic instrument review and simulator familiarization training. Actual time required to get “comfortable” in the simulator is dependent upon past flight experience and rate of progress.

### Automatic Direction Finder (ADF)

4.0 hours

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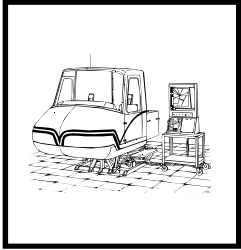
- Orientation
- Tracking:
  - Inbound
  - Outbound
- Intercepting pre-determined track:
  - Inbound tracks (IBT); (QDM)
  - Outbound Tracks (OBT); (QDR)
- Determining Position, time and distance calculations
- Procedure turn

### NOTE :

Sequences will be conducted using both the Radio Magnetic Indicator (RMI) (Rotating Compass Card) and the Fixed Card Indicator (Relative Bearing), subject to the trainer instrumentation.

# Instrument Flight Training Syllabus

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## **V H F Omnidirectional Range (VOR) 4.0 hours**

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- VOR test facility signal (VOT)
- Orientation
- Tracking: To; From
- Intercepting pre-determined track: To; From
- Determining Position
- Determine time and distance
- Procedure turn

### **NOTE**

Sequences will be conducted using the VOR/ILS Indicator, and the Radio Magnetic Indicator (RMI) subject to the trainer instrumentation.

## **Distance Measuring Equipment (DME) 1.5 hours**

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- Intercepting DME ARC
- Tracking DME ARC
- Intercepting Inbound radial from DME ARC / Lead Radials

### **NOTE**

Sequences will be conducted using DME with the Radio Magnetic Indicator (RMI) and VOR Indicator, subject to the trainer instrumentation.

## **Holding 3.0 hours**

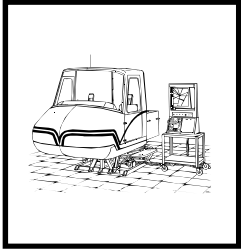
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- Principles of entry to and flying the standard and non standard holding pattern.
- Entry to and holding pattern at:
  - N.D.B.
  - V.O.R.
  - Intersection
  - DME FIX

### **NOTE**

Candidates should have prior knowledge of wind velocity gained from forecast Wind and/or tracking to the holding fix.

# Instrument Flight Training Syllabus



## Approaches and Missed Approaches 6.0 hours

- Full published approach:
  - N.D.B.
  - V.O.R.
  - I.L.S. Front course
  - I.L.S. Front course (Glide path inoperative)
  - I.L.S. Back course
  - P.A.R.
- Approach after holding on an approach fix:
  - N.D.B.
  - V.O. R.
  - I.L.S. Front course
  - I.L.S. Back course
- Transition to straight in approach:
  - Off radar vector
  - Off published transition
- Circling approach

### NOTES

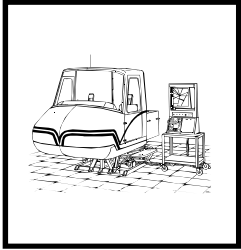
Sequences will be conducted using different available trainer equipment (eg) VOR/ILS Indicator, Radio Magnetic Indicator (RMI), and Fixed Card Bearing Indicator, etc. as available.

Circling procedures will not be possible due to the lack of trainer visual presentation.

Candidates will be exposed to both the landing and the missed approach, following approaches to the missed approach point (MAP) at DH or MDA, subject to trainer capabilities.

# Instrument Flight Training Syllabus

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## **Air Traffic Control (ATC) Procedures** **1.0 hours**

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- Departure:
  - Without radar services
  - With radar services
  - Standard Instrument Departure (SID)
- Arrival:
  - Without radar services
  - With radar services
  - Standard Terminal Arrival Routing (STAR)

### **NOTE**

Departure and arrival sequences will be completed in conjunction with other related sequences.

## **IFR Cross Country** **3.0 hours**

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- Preparation of pilot flight log
- Preparation of ATS flight plan
- Departure
- Enroute
- Holding
- Transition
- Approach
- Missed Approach
- Diversion to alternate
- Approach
- Emergencies

## **Minimum Total Simulator Time** **20.0 Hours**

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# Instrument Flight Training Syllabus

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## FLIGHT TRAINING

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This flight training IFR syllabus is based upon the student successfully completing the related training sequences in a synthetic flight trainer (simulator) prior to undertaking the applicable flight training sequence.

When the synthetic flight trainer is not equipped to provide training in the recommended sequences, or a trainer is not available, the recommended minimum flight times will be increased accordingly to meet the student's training requirements.

The recommended minimum times refer to "Instrument Flight Time" which is defined as: "Flight time during which a pilot is controlling an aircraft by sole reference to the flight instruments and without external reference points". Ground run and taxi time are not credited to Instrument Flight Time. Therefore, approximately .1 hour will be subtracted from each flight time. Up to 15 hours may be completed in an airplane, if desired.

It is recognized that not all training aircraft may be equipped to carry out all recommended training sequences. For example, the aircraft may not be equipped with an RMI to provide ADF and VOR training using that equipment, or DME to permit training in intercepting and flying DME Arcs.

### **Instrument Flying**

**2.0 hours**

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- Use of flight instruments
- Recognition of attitudes
- Straight and level flight
- Climbing, Descending, and Turns
- Climbing turns
- Descending turns
- Co-ordinated patterns
- Recovery from unusual positions

### **NOTE**

The recommended minimum time of 2.0 hours should be regarded as time for review purposes and to familiarize the student with instrument flying on the particular aircraft type. Actual time will be dependent upon the individual student's past instrument flying training, experience and progress.

# Instrument Flight Training Syllabus

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## Automatic Direction Finder (ADF)

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4.0 hours

- Orientation
- Tracking:
  - Inbound;
  - Outbound;
- Intercepting pre-determined track:
  - Inbound;
  - Outbound;
- Determining position
- Determining time and distance
- Procedure turn

### NOTE

Subject to aircraft equipment sequences will be carried out using the Fixed Card Bearing Indicator (Relative Bearing) and the Radio Magnetic Indicator (RMI) (Rotating Compass Card).

## VHF Omnidirectional Range (VOR)

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4.0 hours

- VOR test facility (VOT)
- Orientation
- Tracking:
  - To;
  - From;
- Intercepting pre-determined radials:
  - To;
  - From;
- Determining position
- Determining time and distance
- Procedure turn

### NOTE

Subject to aircraft instrumentation sequences will be carried out with the Horizontal Situation Indicator (HSI), and Radio Magnetic Indicator (RMI).

# Instrument Flight Training Syllabus

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## **Distance Measuring Equipment (DME) 1.5 hours**

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- Intercepting DME ARC
- Tracking DME ARC
- Intercepting radial from DME ARC

This exercise is not available in our helicopter and should be completed during the fixed wing portion of your training.

## **Holding 2.0 hours**

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- Principles of entry to and flying a standard and non-standard holding pattern
- Entry to and holding pattern at:
  - NDB
  - VOR
  - Intersection
  - DME FIX

### NOTES

Sequences will be conducted using the Horizontal Situation Indicator (HSI), and Radio Magnetic Indicator (RMI), subject to aircraft instrumentation.

Students should always have prior knowledge of wind velocity from forecast wind and/or prior tracking to the holding fix.

# Instrument Flight Training Syllabus



## Approaches and Missed Approaches 7.0 hours

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- Full Published Approach:
  - NDB
  - VOR
  - ILS Front Course
  - LOC Front Course (Glide Path Inoperative)
  - LOC Back Course
  - GNSS Overlay
  - PAR
- Approach after holding on an approach facility:
  - NDB
  - VOR
  - ILS Front Course
  - ILS Back Course
  - GNSS
- Transition to Straight-in approach:
  - Off radar vector
  - Off published transition
  - GNSS Stand Alone Approaches
- Circling approach

### NOTES

Sequences will be conducted using different available aircraft equipment (eg) Horizontal Situation Indicator (HSI), Radio Magnetic Indicator (RMI), Fixed Card Bearing Indicator etc.

Students will be exposed to landings and missed approaches from the missed approach point (MAP) at DH or MDA.

# Instrument Flight Training Syllabus

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## **Air Traffic Control (ATC) Procedures** **1.0 hours**

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- Departure:
  - Without radar services
  - With radar services
- Standard instrument departure (SID)
- Arrival:
  - Without radar services
  - With radar services
  - Standard Terminal Arrival Routing (STAR)

### **NOTE**

Departure and arrival sequences be carried out in conjunction with other related sequences.

## **IFR Cross Country** **2.0 hours**

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- Meteorological briefing
- Preparation of pilot flight log
- Preparation of TC flight plan
- Computation of fuel plan
- Departure
- Enroute
- Holding
- Transition and approach
- Missed approach
- Diversion to alternate
- Approach
- Emergencies

## **Minimum Total Flight Training** **20.0 hours**

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# Instrument Flight Training Syllabus

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## GENERAL NOTES

Emergency procedures such as failures of radio navigation and approach aids; communication facilities; and, other aircraft equipment including engine out procedures in the case of multi-engine aircraft, will be interjected into the training sequences at appropriate times.

Cockpit Resource Management (CRM) techniques within a two pilot environment will be stressed throughout the training program.

Clearance copying technique will be developed during both the simulator and flight training portion of the course. The candidate must be able to copy a departure clearance and a hold clearance in full without errors.

The minimum flight times and simulator times shown above are based on a candidate with no previous instrument experience. These times may be reduced if the candidate progresses rapidly enough through the required exercises, and has previous instrument flying credits from either initial flight training or alternate category flight training certified in their log books.