COURSE OUTLINE: AVF111 - METEOROLOGY I & II

Prepared: Paul Bursche
Approved: Greg Farish, Dean, Aviation

Course Code: Title	AVF111: METEOROLOGY I & II
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	AVIATION TECHNOLOGY
Academic Year:	2024-2025
Course Description:	This course equips aspiring pilots with the knowledge and skills needed to excel in the meteorology section of the Transport Canada Private Pilot written exam. It also trains students to interpret weather reports and forecasts effectively, ensuring they are well-prepared for flight operations. By providing an in-depth understanding of meteorological theory, the course lays a strong foundation for sound weather-related decision-making. Additionally, it serves as a cornerstone for advanced meteorology studies in the second and third years of the Aviation Program.
Total Credits:	2
Hours/Week:	2
Total Hours:	30
Prerequisites:	ATQ112
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	AFT131, AFT132, AVF241
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4061 - AVIATION TECHNOLOGY** VLO 1 Aviation Technology - Flight
Essential Employability Skills (EES) addressed in this course:	EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 70%, B A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

Other Course Evaluation & Assessment Requirements:	To be excused from class due to illness or other unforeseen circumstances, students must email the faculty member before the start of class. Students may request a deferment of a test for compassionate reasons, including but not limited to the death of an immediate family member, personal illness, or a recent diagnosis of a serious illness in a family member. Make-ups will not be permitted after the fact for compassionate reasons. Test dates will be announced at least one week in advance. If a faculty member determines that a student is at risk of not succeeding academically and has exhausted all available strategies, the students contact information may be confidentially provided to Student Services to offer additional support. Any student wishing to restrict the sharing of their information should inform the coordinator or faculty member.
Books and Required Resources:	Aeronautical Information Manual (TC AIM - TP 14371) by Transport Canada Publisher: Transport Canada ISBN: none https://www.tc.gc.ca/eng/civilaviation/publications/tp14371-menu-3092.htm Royal Canadian Air Force Weather Manual by 1 Canadian Air Division Publisher: 17 Wint Publishing Office ISBN: 978-0-660-20260-0 Library and Archives Canada Cataloguing in Publication Royal Canadian Air Force Weather Workbook

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
This course focuses on advanced meteorological concepts, including the analysis of complex weather phenomena, atmospheric dynamics, and their impact on aviation. Students will develop skills to interpret advanced weather tools, assess adverse conditions like turbulence and icing, and make informed, safety-oriented flight decisions.	1. Precipitation and Visibility: Explain the processes that lead to different types of precipitation and their effects on flight operations. Analyze the factors influencing visibility and identify conditions that cause reduced visibility, such as fog, haze, and precipitation. 2. Wind Shear and Turbulence: Understand the causes and types of wind shear, including its detection and implications for flight safety. Evaluate the formation and impact of turbulence, including mechanical, thermal, and clear-air turbulence. 3. Airframe Icing: Identify the conditions necessary for the formation of airframe icing and its impact on aircraft performance. Differentiate between types of icing (rime, clear, and mixed) and their associated hazards. 4. Altimetry: Describe the principles of altimetry and its relationship to pressure systems and temperature variations. Recognize the potential errors in altimeter readings and their significance in flight operations. 5.Mountain Waves and Weather Effects: Explain the formation of mountain waves and their associated weather phenomena, such as rotor clouds and lenticular clouds. Assess the impact of mountain waves on aircraft performance and pilot decision-making. 6.Thunderstorms and Convective Activity: Understand the

	development stages of thunderstorms and the associated hazards, such as lightning, hail, and microbursts. Interpret convective weather patterns and evaluate avoidance strategies to ensure flight safety.

Course Outcome 2	**Learning Objectives for Course Outcome 2**
This course outcome enables students to accurately interpret aviation weather forecasts and reports, such as METARs, TAFs, and GFA charts. Students will learn to extract critical information for flight planning, including weather trends, hazards, and conditions affecting route selection and operational safety. This skill ensures pilots can make informed decisions based on real-time weather data.	1. Graphical Area Forecasts (GFA): Understand regional weather conditions, including cloud coverage, precipitation, and significant weather patterns, to ensure comprehensive route planning. 2. Terminal Area Forecasts (TAF): Interpret detailed weather predictions for specific airports, focusing on conditions like visibility, wind, and ceiling critical to departures and arrivals. 3. Upper Wind and Temperature Forecasts (FD): Assess upper-level wind patterns and temperatures to optimize fuel efficiency, flight times, and altitude selection. 4. Air Meteorological Advisory (AIRMET): Recognize weather advisories related to light-to-moderate hazards, such as turbulence or icing, to ensure safe flight operations. 5. Significant In-Flight Weather Warning Messages (SIGMET): Evaluate warnings for severe weather phenomena, including thunderstorms, volcanic ash, or severe turbulence, to mitigate flight risks. 6. Aviation Routine Weather Report (METAR): Decode real-time weather observations at airports, including temperature, wind, visibility, and atmospheric pressure, for pre-flight preparation. 7. Pilot Reports (PIREP): Use firsthand pilot observations to supplement forecast data, identifying real-time weather conditions along intended flight routes. 8. Surface Analysis Charts: Analyze pressure systems, fronts, and isobars to understand surface weather dynamics and their impact on flight plans. 9. Upper Air Charts: Interpret atmospheric conditions at various altitudes, such as jet streams and pressure patterns, to enhance situational awareness and flight efficiency.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Final Exam	40%
Tests	60%

Date: December 5, 2024

Addendum: Please refer to the course outline addendum on the Learning Management System for further

information.