COURSE OUTLINE: AVT361 - METEOROLOGY IV

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Course Code: Title	AVT361: METEOROLOGY IV
Program Number: Name	4061: AVIATION TECHNOLOGY
Department:	AVIATION TECHNOLOGY
Academic Year:	2024-2025
Course Description:	Meteorology IV builds upon foundational meteorology concepts from the first two years, delving into advanced topics critical for aviation safety. The course covers airframe icing, exploring conditions that cause icing, types, catch rates, and associated hazards. Students will examine the stages of thunderstorm development and the hazards they pose. The formation of jet streams and the resulting clear air turbulence will be analyzed. Emphasis will be placed on practical meteorology, including interpreting Significant Weather Prognostic Charts, Upper Air Analysis Charts, Canadian Turbulence Forecast Charts, and using Satellite and Radar imagery. This course aims to equip students with the meteorological expertise necessary for effective flight planning and operational decision-making.
Total Credits:	3
Hours/Week:	1
Total Hours:	15
Prerequisites:	AVT241
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	AVT370, AVT371
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 student`s 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 by Transport Canada

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
Demonstrate a practical knowledge of meteorology theory taken in first and second year.	By the end of this course, students will be able to review and articulate foundational meteorology concepts from the first two years, including vapor pressure, relative humidity, and cloud condensation nuclei. They will demonstrate an understanding of key processes such as freezing point, condensation, and collision-coalescence. Additionally, students will explain the Bergeron-Findeisen process, riming, and aggregation. This foundational knowledge will be essential for comprehending advanced aviation meteorology topics.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Interpret upper weather charts and forecasts.	By the end of this course, students will proficiently interpret Significant Weather Prognostic Charts, Upper Air Analysis Charts, and Canadian Turbulence Forecast Charts. They will accurately analyze Satellite and Radar imagery to identify and predict weather patterns. Students will apply these skills to assess potential aviation hazards and make informed flight planning decisions. This expertise will enhance their operational decision-making and safety in various meteorological conditions.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Identify conditions that cause airframe icing, distinguish between different types, understand catch rates, and recognize associated hazards.	By the end of this course, students will be able to analyze the liquid water content of clouds, droplet size, and temperature conditions that contribute to airframe icing. They will differentiate between various types of icing, including supercooled large droplets and hoar frost, and understand their formation mechanisms. Students will evaluate the catch rate of ice on airframes and identify associated hazards. This knowledge will enable them to assess and mitigate the risks of airframe icing in aviation operations.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Understand the stages of thunderstorm development	By the end of this course, students will be able to describe the stages of thunderstorm development and the various lifting

	and identify the associated hazards to aviation.	mechanisms that initiate them. They will identify the hazards thunderstorms pose to aviation, including turbulence, lightning, and wind shear. Students will also understand the formation and characteristics of hurricanes. This knowledge will enable them to anticipate and mitigate the risks thunderstorms and hurricanes present to flight safety.
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	Explain the formation of jet streams and assess their impact on clear air turbulence.	Understand the principles of upper airflow theory and the factors contributing to jet stream development. Students will be able to analyze the structure and behavior of jet streams. Students will evaluate the relationship between jet streams and clear air turbulence. This knowledge will enable them to anticipate and mitigate turbulence-related risks in aviation operations.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Final	40%
Quizzes	20%
Tests	40%

Date: June 27, 2024

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