

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Safety and Human Factors
CODE NO. : AVT378-3 **SEMESTER:** Seven
PROGRAM: Aviation Technology (Flight)
AUTHOR: Brian Stewart
DATE: Jan 2011 **PREVIOUS OUTLINE DATED:** Jan 2010

APPROVED:

“B.Punch”

CHAIR

DATE

TOTAL CREDITS: 4

PREREQUISITE(S): AVT248

HOURS/WEEK: 4

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COURSE DESCRIPTION:

I.

This course, combined with AVT119 and AVT248, completes the Human Factors knowledge requirement for the ATPL as outlined in both the ICAO Human Factors Training Manual (first edition – 1998) and Transport Canada’s Study and Reference Guide.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Develop personal defense strategies to reduce the occurrence of unsafe acts.
Potential Elements of the Performance:
 - Understand how our personality, and our physiological, psychological, psychosocial and physical needs affect our ability to perform.
 - What is the new view of errors?
 - The rationale and benefits of SOPs.
 - Automation, its benefits and pitfalls.
2. Analyze an accident or incident using Reason’s Model.
Potential Elements of the Performance:
 - Identify the failures in each of the five layers.
 - Develop or suggest strategies to reinforce each of the layers.
 - Be aware of and able to recognize design and automation features which are latent failures in a system.
3. Apply the process of Single Pilot Resource Management(SRM).
Potential Elements of the Performance:
 - The “5P” check
 - The SRM decision process
4. Effectively participate on a team or in a crew.
Potential Elements of the Performance:
 - Communicate effectively to make decisions and manage resources.
 - Provide leadership and followership.
 - Establish priorities to manage workload.
 - Be aware of how decisions related to problem solving fit in the big picture.
 - Resolve conflicts.
 - Provide constructive critiques.
 - Manage threats to reduce or trap errors.
5. Explain the role safety management programs (systems) play in improving the efficiency and safety of complex systems.
Potential Elements of the Performance:
 - The components of SMS.
 - The regulatory framework for SMS in Canada.
 - The role of the safety manager.
 - The use of reporting systems to provide a proactive approach to reducing incidents and accidents.
6. Explain the rationale and process in applying threat and error management.
 - Definitions.

- Types of threats.
 - Types of errors.
 - Handling threats, errors and undesired aircraft states.
7. Explain industry training initiatives and strategies to reduce accidents.
- Potential Elements of the Performance:
- The industries safety record - where we are now; the improvements made over the last twenty years.
 - The why, where and how to reduce the likelihood of the major killers in aviation today.
 - ✚ Loss of control (LOC)
 - ✚ Controlled Flight into Terrain (CFIT)
 - ✚ Approach and Landing Accident Reduction (ALAR)

III. TOPICS:

1. Reason's Model
2. Unsafe Acts – Errors And Violations
3. Personal Defences
4. Single Pilot Resource Management
5. Threat And Error Management
6. Teams and Team Building
7. Communications
8. Group Problem Solving/Decision Making
9. Situational Awareness
10. Leadership/Followership
11. Interpersonal Skills
12. Critique
13. Safety Management Systems
14. Loss of Control
15. Controlled Flight into Terrain
16. Approach and Landing Accident Reduction

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- 1) Human Factors for Aviation - Advanced Handbook / Published by Transport Canada ISBN # 0-660-16656-9
- 2) Internet Access

ADDITIONAL RESOURCES/TEXTS/MATERIALS:

- 1) Aircraft Accident Analysis: Final Reports / James M. Walters and Robert L. Sumwalt III
- 2) Aviation Psychology / Stanley N Roscoe
- 3) Aviation Psychology : Practice and Research / edited by Klaus-Martin Goeters
- 4) Aviation Safety Programs: A Management Handbook, 3rd Edition / Richard H. Wood
- 5) Aviation Visual Perception: Research, Misperception and Mishaps / Randy Gibb, Rob Gray and Lauren Schaff
- 6) Beyond Aviation Safety Human Factors / Daniel E Maurino, James Reason, Neil Johnston, Rob B Lee
- 7) Controlling Pilot Error, Volume 10, Culture, Environment, & CRM / Tony Kern
- 8) Coping with Computers in the Cockpit / Sidney Dekker and Erik Hollnagel
- 9) Crew Resource Management: Critical Essays on Human Factors in Aviation / Eduardo Salas, Katherine A. Wilson and Eleana Edens
- 10) Fatigue in Aviation: A Guide to Staying Awake at the Stick / John A. Caldwell and J. Lynn Caldwell
- 11) Field Guide to Understanding Human Error / Sidney Dekker
- 12) Flightdeck Performance / Stanley Roscoe
- 13) Flight Discipline / Tony Kern
- 14) Flight Safety : A Primer for General Aviation Pilots / Alexander T Wells
- 15) Flight Stress: Stress, Fatigue and Performance in Aviation / Alan Stokes and Kirsten Kite
- 16) Human Contribution: Unsafe Acts, Accidents and Heroic Recoveries / James Reason
- 17) Human Error in Aviation: Critical Essays on Human Factors in Aviation / R. Key Dismukes
- 18) Human Factors in Aviation / Earl L Wiener, David C Nagel
- 19) Human Factors in Multi Crew Operations / Harry W Orlady
- 20) Human Factors Training Manual / ICAO Doc 9683-AN/950
- 21) Limits of Expertise: rethinking pilot error and the causes of airline accidents / R. Key Dismukes, Benjamin A. Berman and Loukia D. Loukopoulos
- 22) Managing the Risks of Organizational Accidents / James Reason
- 23) Multitasking Myth: Handling Complexity in Real World Operations / Loukia D. Loukopoulos, R. Key Dismukes and Immanuel Barshi
- 24) Pilot Judgement and Crew Resource Management / Richard S Jensen
- 25) Pilot – Mental and Physical Performance / David C Edwards
- 26) Redefining Airmanship / Tony Kern
- 27) Safety Management Systems in Aviation / Alan J. Stolzer, Carl D. Halford and John J. Goglia

V. EVALUATION PROCESS/GRADING SYSTEM:

The student will be assessed by a combination of attendance and deportment, assignments, tests and a final exam. Weighting of each will be as follows: 20% for each of the 2 assignments, 20% for all tests prior to the final exam and 40% for the final exam. A minimum mark of 70% is required to pass the course. Make-up tests are not permitted except in accordance with section VI of this outline.

- Unexcused absences will result in 2% deduction of the final mark for each occurrence, arriving for class late will result in a 1% deduction of the final mark for each occurrence, and violations of the dress code will result in a 1% deduction of the final mark for each occurrence. Refer to the SOP GEN 1.3 for dress code policies and SOP GEN 1.6.7 for policy regarding absence from classes
- If it is necessary to write a second final exam in order to pass the course, the highest grade achievable will be a "C". (See make-up policy in section VI)
- Students may request a deferment of a test for compassionate reasons. Compassionate Grounds for deferment will include but not be limited to death of an immediate family member, personal illness, or recent diagnosis of a serious illness of a family member. **Make-ups will not be permitted after the fact for compassionate reasons.**
- A classroom code of conduct can be found in the SOP General section, and will be adhered to.
- Dates of tests will be announced at least 1 week in advance.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	assigned if a make-up exam was required to complete the course	2.00
F (Fail)	below 70%	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *For all AVT classes there is an additional incentive not to miss class. Please refer to Section V Evaluation Process/Grading System for further information.*

Make-up Policy

- No make-ups on tests occurring prior to final exams.
- No make-ups on quizzes.
- If the final grade achieved for this course is less than 70%, a second final exam may be written at the discretion of the professor for this course. The second exam will be averaged with the first exam to determine the resulting exam mark, and the final grade will then be calculated.
- In the event that a second final exam is required, the highest achievable overall grade for this course will be a C
- Any student that requires 100% or greater on a make-up exam to pass the course will not be allowed to write a make-up exam.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.