

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ONTARIO**



Sault College

COURSE OUTLINE

COURSE TITLE: Safety and Human Factors
CODE NO. : AVT378-3 **SEMESTER:** Seven
PROGRAM: Aviation Technology (Flight)
AUTHOR: Brian Stewart
DATE: Jan 2008 **PREVIOUS OUTLINE DATED:** Jan 2007
APPROVED:

	_____	_____
	CHAIR	DATE
TOTAL CREDITS:	4	
PREREQUISITE(S):	AVT248	
HOUR/WEEK:	4	

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The School of the Natural Environment, Technology and Skilled Trades

759-2554 Ext. 2681

I. COURSE DESCRIPTION:

In addition to completing the Human Factors knowledge requirement for the ATPL as outlined in the ICAO Human Factors Training Manual (first edition – 1998), this course will meet the knowledge and skills required for crew resource management.

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, it's 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. 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.

4. 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.

5. Explain industry training initiatives to reduce accidents.

Potential Elements of the Performance:

- CFIT.
- ALAR.
- LOC.

III. TOPICS:

1. Reason's Model
2. Unsafe Acts – Errors And Violations
3. Personal Defences
4. Organizational Defences
5. Physiological And Psychological Preconditions
6. Communications
7. Situational Awareness
8. Problem Solving/Decision Making/Judgement
9. Leadership/Followership
10. Stress Management
11. Interpersonal Skills
12. Critique
13. Threat And Error Management
14. Safety Management Systems
15. Incident and Hazard Reporting Systems
16. CFIT

17. ALAR

18. LOC

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

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

V. 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 Safety Programs, A Management Handbook, 3rd Edition
Richard H. Wood
- 4) Beyond Aviation Safety Human Factors
Daniel E Maurino, James Reason, Neil Johnston, Rob B Lee
- 5) Controlling Pilot Error, Volume 10, Culture, Environment, & CRM
Tony Kern
- 6) Coping with Computers in the Cockpit
Sidney Dekker and Erik Hollnagel
- 7) Flightdeck Performance
Stanley Roscoe
- 8) Flight Discipline
Tony Kern
- 9) Flight Safety – A Primer for General Aviation Pilots
Alexander T Wells
- 10) Flight Stress: Stress, Fatigue and Performance in Aviation
Alan Stokes and Kirsten Kite
- 11) Human Factors in Aviation
Earl L Wiener, David C Nagel
- 12) Human Factors in Multi Crew Operations

Harry W Orlady

13) Human Factors Training Manual

ICAO Doc 9683-AN/950

14) Managing the Risks of Organizational Accidents

James Reason

15) Pilot Judgement and Crew Resource Management

Richard S Jensen

16) Pilot – Mental and Physical Performance

David C Edwards

17) Redefining Airmanship

Tony Kern

18) The Limits of Expertise

R. Key Dismukes, Benjamin A. Berman and Loukia D. Loukopoulos

VI. EVALUATION PROCESS/GRADING SYSTEM:

The student will be assessed by a combination of attendance and department, 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 VII 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 VII)
- 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.**
- **"F" grades in any subject at the end of a semester will result in termination from the Aviation program.**

- Although attitude, co-operation, etc., are not graded, students may be terminated based on their performance in this area (see section VI). These attributes are also considered in the selection of the Air Canada Award and other scholarships.
- Dates of tests will be announced at least 1 week in advance.
- A classroom code of conduct can be found in the SOP General section, and will be adhered to.

The following semester grades will be assigned to students in this course:

<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	0.00
F (Fail)	below 70%	0.00
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.	

VII. SPECIAL NOTES:

Attitude and Conduct

Attitude plays an important role in your ability to exercise good judgement. Although attitude is not being graded, it affects your ability to learn as well as your safety as a student and future as a professional pilot. Students who display a strong tendency towards any of the five hazardous attitudes pose a grave risk to themselves and others. For this reason, students exhibiting one or several hazardous attitudes will be counseled and if necessary, will be sanctioned and given a letter of probation. If this is ineffective in modifying unacceptable behaviour, then the student will be withdrawn from the program.

The five hazardous attitudes are identified as Anti-authority, Impulsivity, Invulnerability, Machismo, and Resignation. These hazardous attitudes are described in "Human Factors for Aviation – Basic Handbook" on pages 151 and 152.

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.

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1101 or call Extension 2703, so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in the *Sault College Code of Conduct*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.