

I. COURSE DESCRIPTION:

Students enrolled in the aviation technology (flight) program will participate in 3 human factor courses. This, the first course, provides an introduction to human factors with a focus on basic flight physiology. You will learn why human factors are so important and the role they will play in your career. The topics covered include: basic human anatomy, hearing, vision, altitude physiology, the atmosphere, sleep and circadian rhythms, stress, situational awareness and orientation, acceleration and motion sickness.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Define human factors and it's importance to aviation

Potential Elements of the Performance:

- Define human factors and flight physiology
- Role in aviation
- The components of human factors described by the "SHEL" model.

2. Describe the basic function of the human body

Potential Elements of the Performance:

- The nervous system
- The body's framework
- The digestive system
- The metabolic system
- The circulatory system

3. Describe the atmosphere

Potential Elements of the Performance:

- Composition and characteristics of the atmosphere
- Atmospheric effect on gases
- Physiological divisions of the atmosphere

4. Understand what is required to maintain your situational awareness

Potential Elements of the Performance:

- What is situational awareness
- What is required to maintain situational awareness
- Signs of losing situational awareness
- Prevention

5. Explain the effect of the atmosphere on the body's functions

Potential Elements of the Performance:

- Respiration

- Hypoxia, types, stages, symptoms, factors affecting your susceptibility, prevention and treatment
 - Carbon monoxide poisoning
 - Decompression
 - Trapped gases
 - Evolved gases
6. Explain the role of hearing and the vestibular apparatus and the effect of vibrations

Potential Elements of the Performance:

- Anatomy of the ear
 - Sound, hearing and hearing loss
 - The effect of vibration on the body
 - The relationship of the inner ear and orientation
 - Types and causes of disorientation
 - Vestibular illusions
7. Explain how the eye works and it's role in orientation

Potential Elements of the Performance:

- Anatomy of the eye
 - Night vision
 - Factors affecting visual acuity
 - Scanning for objects
 - Visual illusions and their affect on orientation
 - Vision and motion sickness
 - Eye protection
8. Realize the significance of the role your health plays in the safe outcome of the flight

Potential Elements of the Performance:

- Dangers of self diagnosis
 - Over the counter medications
 - Caffeine and it's effects
 - Smoking, alcohol and drugs
9. Realize the significance of environmental stresses and their effect on performance and flight safety

Potential Elements of the Performance:

- Temperature control, coping with the extremes
- Dehydration and air quality
- Importance of stress
- Types of stress
- Strategies to reduce, prevent or control stress

10. To deal with fatigue, understand the importance of rest and the effects of jet lag for long range flights

Potential Elements of the Performance:

- Sleep
- Circadian rhythms and jet lag
- Fatigue, symptoms and coping

11. Cope with accelerations and motion sickness in flight

Potential Elements of the Performance:

- Situations in civilian flying
- Tolerance to "G" forces
- Causes of motion sickness and some suggestions to reduce your susceptibility

III. TOPICS:

1. Introduction to human factors
2. Basic human anatomy
3. Atmosphere
4. Situational awareness
5. Altitude physiology
6. Hearing and vibrations
7. Vision
8. Orientation
9. Stress - medical stress and environmental stress
10. Sleep
11. Acceleration and motion sickness

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Basic Flight Physiology 3rd edition – Reinhart

V. OTHER RESOURCES/TEXTS/MATERIALS:

1. From the Ground Up
2. [A.I.M. – aeronautical information manual](#)
3. Human Factors for Flight – Frank H Hawkins (Second Edition)
4. Human Factors for General Aviation – Stanley Trollip & Richard Jensen
Jeppesen Sanderson
5. Aviation Safety Programs – Jeppesen Sanderson
6. Human Factors in Aviation – Earl L Wiener, David C Nagel
7. Pilot Judgement and Crew Resource Management – Richard S Jensen
8. Flight Safety – A Primer for General Aviation Pilots Alexander T Wells
9. Human Factors for Aviation – Basic Handbook – Transport Canada
10. Pilot – Mental and Physical Performance – David C Edwards
11. Beyond Aviation Safety Human Factors – Daniel E Maurino, James Reason, Neil Johnston, Rob B Lee

12. Flightdeck Performance – Stanley Roscoe
13. Redefining Airmanship – Tony Kern
14. Flight Discipline – Tony Kern

Web Links:

<http://www.tc.gc.ca/civilaviation/aviationsafety/menu.htm>

<http://www.faa.gov/pilots/safety/pilotsafetybrochures/>

<http://flightsafety.org/>

<http://www.airforce.forces.gc.ca/dfs-dsv/index-eng.asp>

VI. EVALUATION PROCESS/GRADING SYSTEM:

The student will be assessed by a combination of attendance and deportment, quizzes, tests and a final exam. Weighting of each will be as follows: 20% for quizzes, 40% 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 1.3.1.8 for dress code policies and SOP GEN 1.3.1.13 for the policy regarding absence or tardiness.
- Quizzes will be given without prior notice.
- 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 VII). 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:

Grade	Definition	Grade Point
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		<u>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%	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in non-graded subject area or flight training.	
U	Unsatisfactory achievement in non-graded subject area or flight training.	
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 judgment. 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 these students will be counseled and may be placed on probation. If this is ineffective, then sanctions or involuntary withdrawal may be the only recourse.

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.

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. *Refer to section VI Evaluation Process/Grading System of this course outline for further details on specific attendance requirements for this course.*

VIII. COURSE OUTLINE ADDENDUM:

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

