

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**COURSE OUTLINE**

**COURSE TITLE:** Navigation I & II  
**CODE NO. :** AVF122-2 **SEMESTER:** Two  
**PROGRAM:** Aviation Technology (Flight)  
**AUTHOR:** Louis St Pierre  
**DATE:** Dec 2016 **PREVIOUS OUTLINE DATED:** June 2015  
**APPROVED:** \_\_\_\_\_ *Greg Mapp* <sup>2016</sup> *December 23<sup>rd</sup>*  
**Chair** **DATE**  
**TOTAL CREDITS:** 2  
**PREREQUISITE(S):** none  
**HOURS/WEEK:** 2

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**I. COURSE DESCRIPTION:**

This course starts with the elements involved in Dead Reckoning Navigation. These elements are then combined to enable pilots-in-training to pass the navigation section of the Transport Canada Private Pilot written exam and to learn the techniques that pilots use for navigating in flight. This knowledge is also the basis for the Transport Canada Commercial Written exam in second year, and is also preparatory ground instruction for the Private Pilot Licence.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. Use the grid coordinate system to locate places on earth, and to understand track lines on a map

Potential Elements of the Performance:

Geographical Coordinates, Time and longitude, Time zones, Great circle and Rhumb lines

2. Understand Earth's magnetism

Potential Elements of the Performance:

Variation, converting from True to Magnetic, The Magnetic Compass, compass errors, magnetic dip

3. Interpret Aeronautical Charts and Publications

Potential Elements of the Performance:

VNC, VTA, LO, CFS, basic chart information,

4. Prepare a navigation chart for dead reckoning navigation

Potential Elements of the Performance:

Using plotting instruments to prepare a chart that can be used by a pilot/navigator

5. Use the Jeppesen styled circular slide rule (CR-2 through CR-6) to complete calculations required for Dead Reckoning navigation

Potential Elements of the Performance:

calculations include groundspeed, estimated time enroute, unit conversions, heading, pressure altitude, true altitude and so on

**Note: only the Jeppesen circular-style flight computer will be taught.**

6. Understand and apply Mental Dead Reckoning Techniques

Potential Elements of the Performance:

Maximum drift, using MDR techniques to estimate a heading and estimated time enroute

7. retrieve and interpret airport information  
Potential Elements of the Performance:  
learn to use the Canada Flight Supplement
8. prepare for a cross country flight in preparation for AFT130 in the summer  
Potential Elements of the Performance:  
completion of two projects that will guide students in the learning how to complete the Sault College navigation log and prepare for a cross country
9. understand radio theory and some of the basic principles of radio navigation aids  
Potential Elements of the Performance:  
radio theory, VOR, transponders, GPS
10. Understand and apply the theory and techniques of dead reckoning navigation, as well as theory of radio navigation aids, required for the completion of the navigation portion of the Transport Canada Private Pilot Exam  
Potential Elements of the Performance:  
this course prepares students for the Private Pilot exam and the Commercial Pilot exam as well as the applicable qualification exams
11. understand and apply practical navigation techniques  
Potential Elements of the Performance:  
applying the knowledge gained in learning how to confirm or revise estimated time enroute, practical drift correction, the watch-to-computer-to-map-to-ground technique, diversions by simulating cross countries

### III. TOPICS:

1. Grid coordinates, Time Zones, Great Circle vs. Rhumb Line
2. Earth's Magnetism and the magnetic compass
3. Aeronautical charts and publications
4. Navigation Chart preparation
5. the Jeppesen circular slide rule flight computer
6. Mental Dead Reckoning
7. The Canada Flight Supplement (CFS)
8. cross country navigation log preparation
9. Radio Navigation Aids
10. Preparation for the Transport Canada written exam
11. Practical Navigation

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

From The Ground Up

Flight Training Manual

Sault Ste Marie VNC

Jeppesen CR-type circular slide rule Navigation Computer

Canada Flight Supplement

Aeronautical Information Manual (AIM)

Navigational Plotting Instruments

**Electronic flight computers that TC will allow:**

- Jeppesen/Sanderson PROSTAR
- Jeppesen/Sanderson AVSTAR
- Jeppesen TECHSTAR
- Jeppesen TECHSTAR PRO
- ASA CX-1a PATHFINDER
- ASA CX-2 PATHFINDER \*
- CESSNA SKY/COMP
- NAV-GEM
- SPORTY'S E6B

**Notes:**

- **Although the electronic flight computers mentioned above are useful for written exams and pre-flight planning, the circular slide rule navigation computers are ESSENTIAL for use in the airplane for groundspeed and ETA calculations, so each student must have one for in-flight navigation, and this class.**
- **The use of these electronic calculators will not be taught in class. Only how to use the circular flight computer.**
- **Cell phones or tablets, or any other type of computer device will not be allowed on any test. Only the above mentioned flight computers or scientific calculators that do not have any memory capabilities**

**V. EVALUATION PROCESS/GRADING SYSTEM:**

The student will be assessed by a combination of projects, tests and a final exam. Weighting of each will be as follows: 10% for the projects, 40% for the tests and 50% for the final exam. The final exam will cover all material taught throughout the semester and will approximate the navigation portion of the Transport Canada written exam. Marks will be deducted for unexcused absences (see special notes for details) or for not having navigation equipment in class. In order to pass the course, a minimum grade of B must be achieved; otherwise the course must be repeated in accordance with the Aviation Standard Operating Procedures.

- **Projects handed in late:** handed in next day after due date: 25% deduction. 2 days late: 50% deduction. Three days: 75%. Projects will not be accepted after that and a mark of zero awarded
- In order to be excused from class due to illness or other unforeseen circumstance, students must call the professor at extension 2666 and leave a message prior to the start of class. An email is also acceptable, but must be sent prior to the start of class.
- 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.**
- Dates of tests will be announced at least 1 week in advance.
- If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

<b>Grade</b>	<b><u>Definition</u></b>	<b><i>Grade Point Equivalent</i></b>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 – 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	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.	

**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. It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers may not be granted admission to the room.

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. To avoid losing marks due to illness, you must contact the professor and leave a voice message (which is time-stamped) or an email **PRIOR TO THE START OF THE CLASS**. Calling after the class begins will indicate that the student simply slept in and was not in fact sick.

**Navigation materials and equipment for each class**

There will be many exercises for students to do in class in order to practice the skills that they learn. It is vital that each student get a chance to practice these skills, as it is the only way to properly learn them. It is also vital that each student works alone so they can learn to accomplish those skills unassisted, such as when they have to do it in an airplane or during a Transport Canada written test. If a student does not have the proper material for an exercise, they will not be allowed to work with others, since this would cause a considerable distraction to those classmates. Since not being able to do the in-class exercises is tantamount to not attending class, a deduction of 2% per class will assessed.

For each class, students must have on hand:

- A current Sault Ste Marie VFR navigation chart (VNC)
- ICAO ruler or similar
- Douglas Protractor or similar
- Flight computer
- a current Canada Flight Supplement (CFS)

**Cell phones and computers**

Cell phones are not required for any part of the class activities. Texting and web use will only cause unnecessary distraction, and therefore is not allowed. Anyone using their cell phone during class may be asked to leave for the duration of the class hour. No deduction in marks will occur. Some students like to use their laptop. This is not necessary since all course material is available both in their textbooks or on LMS. Students are allowed to use them but this permission will be withdrawn if a student is caught using their laptop for non-class related use.



## COURSE OUTLINE ADDENDUM

1. Course Outline Amendments:  
The faculty member reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.
2. 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.
3. Prior Learning Assessment:  
Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Key Dates Calendar for the deadline date by which application must be made for advance standing.  
  
Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio. Student Services can provide information regarding the Prior Learning Assessment and Recognition policy or it can be viewed on the student portal.  
  
Substitute course information is available in the Registrar's office.
4. Student Portal:  
The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information timetable, grades, records of achievement, unofficial transcript, and outstanding obligations. In addition announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more is available. Go to <https://my.saultcollege.ca>.
5. Communication:  
The College considers *Desire2Learn (D2L)* as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of this Learning Management System (LMS) communication tool.



6. Accessibility Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with the Accessibility Services office. Call Ext. 2703 or email [studentsupport@saultcollege.ca](mailto:studentsupport@saultcollege.ca) so that support services can be arranged for you.

7. Audio and Video Recording Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. Students with disabilities who require audio or visual recording devices in the classroom as an accommodation will receive approval from their counsellor once the Audio and Video Recording Devices in the Classroom Policy has been reviewed by the student. Recorded classroom instruction will be used only for individual academic use and will not be used for any other purpose. Recordings may only be used for individual study of materials presented during class and may not be published or distributed. Intentional misuse of audio and video recordings or intentional misrepresentation when requesting the use of a device for recording shall constitute a violation of this policy and laws protecting intellectual property.

8. Academic Dishonesty:

Students should refer to the definition of “academic dishonesty” in the *Student Code of Conduct*. Students who engage in academic dishonesty will be issued a sanction under the Student Code of Conduct which could lead to and include expulsion from the course/program. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, students must use a documentation format for referencing source material.

9. Tuition Default:

Students who have defaulted on the payment of tuition) as of the first week of November (fall semester courses), first week of March (winter semester courses) or first week of June (summer semester courses) will be removed from placement and clinical activities due to liability issues. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.