

**MATHEMATICS, SCIENCE AND IT ACADEMY**

**SEMESTER 1 2019**

<b>Course Title</b>	<b>Flight (T)</b>	<b>Course Code</b>	<b>2317</b>
<b>Semester Unit</b>	Meteorology and Human Factors	<b>Unit Code, Value</b>	22662, 1.0
<b>Term 1 Unit</b>	Meteorology and Human Factors a	<b>Unit Code, Value</b>	22663, 0.5
<b>Term 2 Unit</b>	Meteorology and Human Factors b	<b>Unit Code, Value</b>	22665, 0.5

**Unit Description**

In this unit students will study meteorology and its application to aviation and the limitations of aircraft operation and design based on human physiological limitations. Students use mathematics in quantitative and qualitative descriptions. Students develop science inquiry skills and learn about science as a human endeavour.

**Specific Unit Goals**

By the end of this unit, students:

- demonstrate depth and breadth of scientific knowledge of the physical processes underlying meteorology
- critically research, analyse, evaluate and synthesise meteorological data from a variety of sources
- develop hypotheses and design models and simulations to investigate the relationship between physical variables in meteorology
- demonstrate depth of understanding of human physiology as it applies to aviation, especially the eyes, ears, vestibular apparatus, lungs and circulation
- research and discuss the effects of drugs and medications on aircrew

## Content Description

- identify, research and construct questions that explain weather systems and their effects on safe flight
- evaluate the safe use of different types of aviation weather report and equipment for communicating weather conditions across Australia
- represent and organise data in meaningful and useful ways, including using appropriate SI units and symbols, to identify trends, patterns and relationships
- investigate a range of aviation and media texts, and evaluate processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments
- select, use and interpret appropriate mathematical models, including graphs and tables of data, to solve problems and make predictions concerning aircraft performance
- predict the safety implications of meteorological information obtained through various sources
- analyse and describe the work of researchers and meteorologists in the development and application of weather forecasting systems and technologies
- critique the ethical, legal and environmental issues that influence the safe use of aircraft
- identify the structure of the atmosphere and the effect on the temperature gradient
- explain the effect of the Earth's radiation budget and atmospheric temperature on weather
- apply Boyle's Law to the relationship between density, temperature and pressure for an ideal gas
- recognise and describe the inverse relationship between humidity and temperature
- define dew point and its relevance to condensation and fog
- define specific and latent heat and their roles in atmospheric energy transfer
- plot information about frontal systems and synoptic charts to predict wind direction, cloud types and weather conditions
- interpret meteorological forecasts and reports, synoptic charts and aerological diagrams
- identify Australian weather services for flight planning
- understand and illustrate the anatomy and function of the circulatory and respiratory systems, the ear and the eye
- discuss the limits of vision and vision illusions and provide specific examples relevant to aviation
- evaluate the role of stress, arousal and fatigue in flight safety
- identify factors in effective decision-making and cockpit workload management

## Science Unit Grade Descriptors for T courses

	A student who achieves an <b>A</b> grade typically	A student who achieves a <b>B</b> grade typically	A student who achieves a <b>C</b> grade typically	A student who achieves a <b>D</b> grade typically	A student who achieves an <b>E</b> grade typically
Knowledge and Understanding	<ul style="list-style-type: none"> <li>demonstrates thorough and extensive knowledge and understanding of scientific concepts</li> <li>justifies and applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displays originality and lateral thinking in problem solving</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates broad and in-depth knowledge and understanding of scientific concepts</li> <li>applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displaying originality and effective thinking in problem solving</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates broad and general knowledge and understanding of scientific concepts</li> <li>is able to apply knowledge in a variety of contexts and different concept areas to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates general and basic knowledge and understanding of scientific concepts</li> <li>is able to use knowledge in different areas to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates a limited knowledge of scientific concepts</li> <li>displays emerging awareness of strategies to solve problems</li> </ul>
Critical Thinking	<ul style="list-style-type: none"> <li>evaluates, synthesises and analyses patterns and trends in data, observations and investigations and makes valid and perceptive inferences</li> <li>applies highly effective analytical and evaluative skills, makes perceptive connections between scientific concepts, draws accurate conclusions and proposes appropriate improvements</li> </ul>	<ul style="list-style-type: none"> <li>analyses and synthesises patterns and trends in data, observations and investigations and makes valid inferences</li> <li>applies effective analytical skills, makes insightful connections between scientific concepts, draws mostly accurate conclusions and proposes appropriate improvements</li> </ul>	<ul style="list-style-type: none"> <li>describes and explains patterns and trends in data, observations and investigations and makes general inferences</li> <li>describes and explains general connections between scientific concepts, draws conclusions and proposes improvements</li> </ul>	<ul style="list-style-type: none"> <li>identifies and describes patterns in data, observations and investigations and makes simple inferences</li> <li>describes connections between scientific concepts, draws conclusions and proposes improvements</li> </ul>	<ul style="list-style-type: none"> <li>identifies patterns in data, observations and investigations</li> <li>identifies connections between scientific concepts</li> </ul>
Investigative Skills	<ul style="list-style-type: none"> <li>demonstrates logical and coherent investigations, acknowledges information using referencing conventions and operates equipment highly effectively and safely</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates well considered investigations, acknowledges information using referencing conventions and operates equipment effectively and safely</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates considered investigations, acknowledges information using referencing conventions and operates equipment safely with some general effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>outlines investigations, inconsistently acknowledges information using referencing conventions and mostly operates equipment effectively and safely</li> </ul>	<ul style="list-style-type: none"> <li>displays emerging skills in investigations, attempts to acknowledge information and operates equipment with limited awareness of safety procedures</li> </ul>
Communication	<ul style="list-style-type: none"> <li>presents highly complex concepts accurately and coherently in a wide range of written and non written formats using appropriate terminology with flair</li> </ul>	<ul style="list-style-type: none"> <li>presents concepts clearly and logically in a range of written and non written formats using appropriate terminology with confidence</li> </ul>	<ul style="list-style-type: none"> <li>presents general concepts clearly in a range of written and non written formats using appropriate terminology generally using terminology appropriately</li> </ul>	<ul style="list-style-type: none"> <li>presents basic concepts in a narrow range of written and non written formats using terminology inconsistently</li> </ul>	<ul style="list-style-type: none"> <li>presents some basic concepts in a limited range of written &amp; non written formats using minimal terminology</li> </ul>
Work practices	<ul style="list-style-type: none"> <li>organises time and resources to work in a highly productive and safe manner both independently and in a team</li> <li>evaluates and analyses risks, acts highly appropriately in all investigations</li> </ul>	<ul style="list-style-type: none"> <li>organises time and resources to work in a productive and safe manner both independently and in a team</li> <li>analyses and explains risks and acts appropriately in all investigations</li> </ul>	<ul style="list-style-type: none"> <li>organises time and resources to work in a generally productive and safe manner both independently and in a team</li> <li>identifies and describes risks and acts appropriately in all investigations</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates inconsistent organisation of time &amp; resources, works with occasional productivity &amp; some awareness of safety independently or in a group</li> <li>identifies risks and acts mostly appropriately in investigations</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates limited organisation of time &amp; resources to work with an emerging awareness of safety</li> <li>demonstrates an emerging awareness of risks, developing approaches to investigations</li> </ul>

## ASSESSMENT

TASK	DUE DATE	WEIGHTING
Test 1	Exam Week term 1	30 %
Assignment	Week 12	40 %
Test 2	Exam Week term 2	30 %

### Specific Entry & Exit Requirements for Term Units

Test 1 and Part A of the assignment must be completed for Unit 22663.

Test 2 and Part B of the assignment must be completed for Unit 22665.

## POLICIES AND PROCEDURES

All students are encouraged to read and understand the full policies and procedures available from the BSSS website [http://www.bsss.act.edu.au/data/assets/pdf\\_file/0010/313777/PandPManual\\_2015\\_Version\\_19.pdf](http://www.bsss.act.edu.au/data/assets/pdf_file/0010/313777/PandPManual_2015_Version_19.pdf).

The following items are of particular relevance to many students.

## ATTENDANCE AND PARTICIPATION

Students are expected to submit all assessment items and attend all classes, participate in a positive manner and seek support whenever it is required. Excursions, simulations and presentations by visitors (including lunchtime) may form part of class work. It is your responsibility to catch up on missed work when absent from class.

Any student whose attendance falls below the 90% of the scheduled classes/contact time and has not provided substantial documentary evidence to cover the absence will be awarded a V grade. This means that 4 unexplained absences in a term or 8 unexplained absences in a semester could mean that a V grade may be awarded. However, the Principal has the right to exercise discretion in special circumstances if satisfactory documentation is supplied.

## LATE SUBMISSION OF WORK

Students are encouraged to submit work on time as it is a valuable organisational skill. Students are also encouraged to complete work even if it is late, as there are educational benefits in doing so.

Late work will receive a penalty of 5% (of possible marks) per calendar day late, unless an extension is granted by the class teacher prior to the deadline. This means that 5% is taken off the possible marks that could have been achieved eg. If a student achieved a score of 75/100, and the item is one day late, then five marks (5% of 100) would be taken from 75, which leaves the score as 70/100. 'Per calendar day late' means each day late whether it be a weekend or public holiday. Items due on any date must be submitted to the class teacher, faculty staff room, or front office at the college by 3.30pm on that day. After 3.30pm, the item will attract the late penalty. Submission of work on a weekend or public holiday is not acceptable. If you do not submit your work to your class teacher, make sure that it is signed and dated by either another member of staff in the faculty staffroom, or a member of the front office staff.

After 7 days, late work will be awarded the Notional Zero. Calculation of a Notional Zero is based on genuine scores, (items submitted on time or with an extension). The Notional Zero will be a score that lies between 0.1 of the standard deviation below the lowest genuine score for that item and zero. If the lowest genuine score is zero, then the notional score is zero.

No work will be accepted after marked work has been returned or accepted after the unit has completed. Computer and/or printer failure will not be accepted as a valid reason for late work. Make sure you backup, keep hard copies and rough notes.

Unless prior approval is granted, any student who fails to submit assessment tasks worth in total 70% or more of the assessment for the unit will be considered to be unassessable and will receive a V grade. The Principal has the right to exercise discretion in the application of the late penalty in special circumstances where satisfactory documentation is supplied.

### **CHEATING AND DISHONEST PRACTICE**

The integrity of the College's assessment system relies upon all involved acting in accordance with the highest standards of honesty and fairness. Any departure from such standards will be viewed very seriously.

Accordingly:

- Plagiarism - claiming authorship of someone else's work (intentionally or otherwise) - is a serious misdemeanour, and attracts severe penalties.
- Students are required to acknowledge the source of all material that is incorporated into their own work.
- Students may not submit the same item for assessment in more than one unit, unless specific agreement has been reached with the class teacher.

### **MODERATION**

Throughout the semester, moderation in the form of common marking schemes, cross marking and joint marking occurs across all units in the Moderation Group to ensure comparability of standards. Moderation is a process whereby student's work is compared so that student performance can be graded fairly and consistently. Moderation takes some time, and so students may not receive their work back until ACT wide moderation of grades across all colleges has occurred. Small Group Moderation is carried out in courses with small class sizes.

### **UNIT SCORES**

- Raw scores are calculated by adding Z scores according to the weightings in the assessment table.
- All raw unit scores are then combined into two rank order lists, one for each cohort Year 11 and 12. Each list is reviewed by the Executive Teachers concerned to identify any anomalies.
- Each of the rank order lists is then standardised for each semester using historical parameters or back scaling.

### **RIGHT TO APPEAL**

You can appeal against your assessment if you feel that the result you obtained is not fair. You should first talk to your class teacher, and if you are not satisfied with the explanation you must discuss the situation with the Executive Teacher of the faculty concerned. If you still do not feel that your result is fair you should talk to the Deputy Principal Programs for further advice on the 'appeal process'.

**Executive Teacher: Ruth Edge**

**Date 12/02/2019**

**Class Teacher: Terry Brady**