UNIT 2.03 – NAVIGATION AND METEOROLOGY SYLLABUS

Note: The pass mark for the examinations set to this syllabus is 80%.

1. CROSS COUNTRY ENDORSEMENT

| 1.1 – NAVIG | 1 - NAVIGATION | | d prior to: |
|-------------|--|------|-------------|
| | | Solo | P/Cert |
| 1.1.1 | Basics – Extract Information from documents. | B/P | C/P+ |
| | Note: Reference to AIP "visual" charts means the present ERC-L, VTC, VNC and AUS PCA and includes any subsequent changes to charts required for flight under VFR. | | |
| | On a WAC and AIP "visual" charts (if applicable) which cover the local area of operation: | B/P | C/P+ |
| | (a) identify, without reference to the chart legend: | | |
| | i. major features to assist in map reading e.g. roads, rivers, lakes; | | |
| | ii. obstacles and spot heights, including elevation or height above terrain; | | |
| | iii. CTA, PRDs, and aerodrome data on VTC/ERC (if applicable); | | |
| | (b) decode other symbols with reference to the chart legend | | |
| | (c) assess the general height of the terrain from hypsometric tints and contours; | | |
| | (d) estimate track and distance; | | |
| | (e) demonstrate and explain the reason for chart orientation in flight. | | |
| | On AIP visual charts identify airspace boundaries and symbols with reference to the chart legend. | B/P | C/P+ |
| | Use ERSA to extract the following regarding aerodromes: | B/P | C/P+ |
| | (a) runway data; | | |
| | (b) special procedures; | | |
| 1.1.2 | Computation Techniques. | | |
| | Use mental rules of thumb to estimate: | B/P | C/P+ |
| | (a) time interval using estimated GS and distance e.g. 120 KT = 2 NM/MIN; | | |
| | (b) endurance; given fuel flow and fuel available (excluding reserve fuel). | | |
| | Note: Students should be given examples to indicate that over short distances and periods of time, such approximations are reasonably accurate. | | |
| | Apply magnetic variation to obtain magnetic direction. | B/P | C/P+ |
| | Determine head/tail, and x-wind components given W/V and HDG. | B/P | C/P+ |

| 1.1.3 | Form of the Earth. | | |
|-------|--|-----|------|
| | In order to apply this knowledge a student should have an understanding of the items listed in (a) to (f) and, if applicable, their effect on: | | |
| | • position on the earth | B/P | C/P+ |
| | • time differences | B/P | C/P+ |
| | distance and direction | B/P | C/P+ |
| | (a) the shape and rotation of the earth; | | |
| | (b) latitude, longitude; | | |
| | (c) meridians of longitude, parallels of latitude; | | |
| | (d) difference between true and magnetic north; | | |
| | (e) terrestrial magnetism, magnetic variation and the change in variation with time; | | |
| | (f) distance on the earth i.e. relationship between a minute of latitude and a nautical mile. | | |
| 1.1.4 | Time. | | |
| | Explain the terms UTC, Local Mean Time, Local (Standard) Time, Local summer time. | B/P | C/P+ |
| | Extract (within +/- 5 min) the beginning and end of civil twilight from AIP daylight and darkness graphs. | B/P | C/P+ |
| | Carry out conversions between: | B/P | C/P+ |
| | • LMT, UTC, Local (Standard) times including local summer time | | |
| | List factors which may cause daylight to diminish earlier than the time extracted from AIP darkness graphs. | B/P | C/P+ |
| | Describe the effect of the earth's rotation and revolution around the sun on the: | B/P | C/P+ |
| | (a) beginning and end of daylight; | | |
| | (b) period of daylight; | | |

RA-Aus SYLLABUS OF FLIGHT TRAINING

| 1.1.5 | Charts and Publications. | | |
|-------|--|-----|------|
| | Note: AIP "Visual Charts" refers to the present ERC-L, VTC, VNC and AUS PCA and embraces any subsequent changes to charts required for flight under VFR. | | |
| | From AIP "Visual Charts" and ERSA, select the chart(s) document(s) which contain information about a given item of operational significance. | B/P | C/P+ |
| | Extract/decode symbols and apply information displayed on AIP "visual charts". | B/P | C/P+ |
| | Interpret topographic detail and decode symbols displayed on a WAC, VTC and VNC. | B/P | C/P+ |
| | On a WAC and AIP "visual charts": | B/P | C/P+ |
| | (a) measure distance: | | |
| | i. using chart and latitude scale; | | |
| | (b) plot a position given: | | |
| | i. latitude and longitude; | | |
| | ii. bearing and distance. | | |
| | Note: Students should also practice techniques to estimate track and distance. | | |
| 1.1.6 | Computations. | | |
| | Review computations and conversions and: | B/P | C/P+ |
| | (a) solve GS, distance, fuel used, fuel required, fuel remaining and fuel consumption problems, given appropriate combinations of these factors; | | |
| | (b) determine HDG, GS and drift given TAS, W/V, TR; | | |
| | (c) determine TR given HDG, TAS, W/V; | | |

RA-Aus

1.1.7

SYLLABUS OF FLIGHT TRAINING

Pilot Navigation.

ISSUE 7 - OCTOBER 2014

Unit 2.03-4

| Pilot Navigation. | | |
|---|-----|------|
| Principles of map reading: | B/P | C/P+ |
| (a) describe the method of chart orientation; | | |
| (b) list situations when a pilot should read: | | |
| i. from map to ground; | | |
| ii. from ground to map; | | |
| (c) select appropriate position lines to establish: | | |
| i. ground speed; | | |
| ii. track error; | | |
| iii. a fix; | | |
| (d) select appropriate ground features to establish position when flying: | | |
| i. at low level (500 FT AGL); | | |
| ii. between (approximately) 2000 and 10,000 FT; | | |
| iii. over mountainous terrain, coastal areas, densely populated and sparsely populated areas. | | |
| Chart preparation and selection (practice): | B/P | C/P+ |
| (a) draw tracks, track error lines, time/distance markings; | | |
| (b) given a route: | | |
| • select WAC(s) and appropriate AIP "visual charts" | | |
| With reference to a planned or given track and given appropriate data: | B/P | C/P+ |
| (a) determine track made good (TMG); | | |
| (b) calculate drift; | | |
| (c) determine alteration of heading or HDG(M) to: | | |
| i. parallel track; | | |
| ii. intercept track at a nominated point; | | |
| iii. maintain track once track is intercepted. | | |
| (d) revise/confirm estimates or ETA using latest ground speed or time/distance proportion; | | |
| (e) establish a DR position using latest TR & GS. | | |
| Note: Whilst the use of a map plotter is acceptable, students should be taught to employ mental dead reckoning and proportional techniques to solve in-flight navigational problems. | | |
| Monitor flight progress by maintaining an in-flight navigation log. | B/P | C/P+ |
| Monitor fuel consumption and revise fuel reserves. | B/P | C/P+ |
| Plan in-flight diversions: | B/P | C/P+ |
| (a) around adverse weather; | | |
| (b) to a suitable aerodrome. | | |
| Note: Diversions must address all appropriate items listed in AIP with respect to flight plan amendments. | | |

SYLLABUS OF FLIGHT TRAINING

| 1.2 – METEC | 1.2 - METEOROLOGY | | l prior to: |
|-------------|--|------|-------------|
| | | Solo | P/Cert |
| 1.2.1 | Knowledge of Local Weather. | | |
| | Demonstrate a basic knowledge of local weather, in particular the likely occurrence of : | B/P | C/P+ |
| | (a) thunderstorms; | | |
| | (b) low cloud; | | |
| | (c) poor visibility; | | |
| | (d) turbulence; | | |
| | and describe how these phenomena may affect the safe operation of an aeroplane. | B/P | C/P+ |
| 1.2.2 | Knowledge of Forecasts and Reports. | | |
| | Demonstrate an understanding of weather forecasts, reports and broadcasts that are pertinent to the area of operation. | B/P | C/P+ |
| | Know the terms and abbreviations used in forecasts and where to obtain decodes. | B/P | C/P+ |
| | Demonstrate an ability to obtain relevant forecasts. | B/P | C/P+ |
| 1.2.3 | Understand Significance of Observations. | | |
| | Recognise signs which may indicate the presence of : | B/P | C/P+ |
| | (a) turbulence, thermals, dust devils; | | |
| | (b) wind gradient, wind shear, | | |
| | and describe the effect of these phenomena on flight characteristics. | B/P | C/P+ |
| | Note: "Signs" means forecast conditions and pilot observations. | | |

| 1.2.4 | Atmospheric Pressure: | | |
|-------|---|-----|------|
| | Demonstrate an understanding of : | B/P | C/P+ |
| | (a) Unit of measure (b) Variation with height (c) Pressure altitude (d) Effects of pressure altitude (e) ICAO standard atmospheric pressure | | |
| 1.2.5 | Atmospheric Temperature: | | |
| | Demonstrate an understanding of: | B/P | C/P+ |
| | (a) Units of measure (b) Variation with height (c) Density altitude (d) Effects of density altitude (e) ICAO standard atmospheric temperature | | |

ISSUE 7 - OCTOBER 2014

Unit 2.03-6

SYLLABUS OF FLIGHT TRAINING

| 1.2.6 | Pressure systems and fronts: | | |
|-------|--|-----|------|
| | Demonstrate an understanding of: | B/P | C/P+ |
| | (a) Depression or low pressure (b) Anti-cyclone or high pressure (c) Cold and warm fronts (d) General characteristics of pressure systems and fronts over Australia (e) Horizontal pressure (f) Isobars | | |
| 1.2.7 | Cloud Classifications: | | |
| | Demonstrate and be able to identify different cloud classifications and the weather associated with them. | B/P | C/P+ |

| 1.2.8 | Visibility: | | |
|-------|--|-----|------|
| | Demonstrate an understanding of the effects on visibility of : | B/P | C/P+ |
| | (a) Haze (b) Smoke (c) Fog | | |

| 1.2.9 | Turbulence: | | |
|-------|--|-----|------|
| | Demonstrate a knowledge and understanding of turbulence in relation to the following: | B/P | C/P+ |
| | (a) Mechanical (b) Terrain (c) Convectional (d) Local winds (e) Slipstream (f) Wake | | |

| 1.2.10 | Wind: | | |
|--------|--|-----|------|
| | Demonstrate a knowledge and understanding of: | B/P | C/P+ |
| | [a] Wind velocity (b) Wind shear (c) Wind gradient (d) Backing and veering (e) Sea breezes (f) Fohn winds (g) Valley winds (h) Anabatic and katabatic winds | | |

| 1.2.11 | Mountain waves | | |
|--------|---|-----|------|
| | Demonstrate an understanding of: | B/P | C/P+ |
| | (a) conditions and severity at which they occur(b) how they can affect flight conditions | | |

| 1.2.12 | Met Reports and Forecasts: | | |
|--------|--|-----|-----|
| | Demonstrate an understanding of: | B/P | C/P |
| | (a) Metar's (b) Speci's (c) TTF (d) TAF (e) AFOR (f) Sigmet (g) Airmet | | |

-End of Navigation and Meteorology Syllabus-