COURSE OUTLINE: ASR103 - AIRCRAFT STRUCTURES

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Course Code: Title	ASR103: AIRCRAFT STRUCTURES
Program Number: Name	4067: AIRCRAFT STRUCT TECH
Department:	AIRCRAFT STRUCTURAL REPAIR
Semesters/Terms:	19F
Course Description:	Through the use of textbooks, video and in-class presentations, students will become familiar with the structural components used to construct fixed wing and rotary wing aircraft. Weight and balance procedures are researched and calculations for center of gravity are performed. The students will also become familiar with the different types of hardware used in the construction of modern aircraft.
Total Credits:	4
Hours/Week:	4
Total Hours:	64
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4067 - AIRCRAFT STRUCT TECH** VLO 1 Safely use the tools, equipment and identify materials needed to carry out various sheet metal repairs. VLO 2 Demonstrate a working knowledge of the principles of aircraft design by applying theory and shop practice. VLO 3 Identify and order airframe parts with the use of Maintenance and Parts Manuals to complete necessary repairs. VLO 6 Carry out any repair according to specifications, stated job procedures and the requirements of the Department of Transport Regulations. VLO 7 Refer to specific aircraft manuals such as Aircraft Pocket Manual and Hardware Manual to determine safe and acceptable procedures and parts. VLO 9 Apply weight and balance formulas. VLO 11 With the use of manuals quickly locate and pinpoint station locations on fuselage construction and wing structures. VLO 14 Apply Department of Transport regulations to paperwork and authorization licences to release aircraft back to service.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 10 Manage the use of time and other resources to complete projects.

Course Evaluation:	Passing Grade: 70%, B
Other Course Evaluation & Assessment Requirements:	Three tests: Test#6 Aircraft Structures (50% of final grade) Test#7 Aircraft Weight & Balance Control (25% of final grade) Test#8 Aircraft Hardware (25% of final grade)
Books and Required Resources:	Aviation Maintenance Technician Handbook: Airframe: Volume 1 by Federal Aviation Administration ISBN: 9781560279501 Aviation Maintenance Technician Handbook: Airframe: Volume 2 by Federal Aviation Administration ISBN: 9781560279525 Aviation Maintenance Technician Handbook: General by Federal Aviation Administration ISBN: 9781619540255 Standard Aviation Maintenance Handbook by Jeppesen ISBN: 9780884871316

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Describe aircraft structural components used in the construction of fixed wing and rotary wing aircraft.	1.1 describe the five stresses acting on an aircraft during flight 1.2 discuss the purpose of an aircraft fuselage 1.3 identify the most common aircraft fuselage designs and their construction 1.4 describe in detail, the semi-monocoque fuselage design 1.5 describe the purpose of all the construction members in a fuselage design 1.6 identify the components used to construct an aircraft wing and their purpose in the construction of the wing 1.7 describe the factors considered in designing an aircraft wing 1.8 discuss wing spar types and construction 1.9 describe honeycomb material use in aircraft structures and the advantages 1.10 identify various aircraft nacelles and engine mounts 1.11 describe various types of engine cowlings found on modern aircraft 1.12 identify the structural parts of the tail section of an aircraft 1.13 identify the structural parts of a modern helicopter 1.14 describe the construction of aircraft doors
Course Outcome 2	**Learning Objectives for Course Outcome 2**
2. Discuss after repairs and modifications to aircraft structures, new weight and balance figures to derive the new centre of gravity of the aircraft.	2.1 discuss the reasons for re-weighing of aircraft 2.2 describe the results of improper loading of aircraft 2.3 describe the mandatory times aircraft must be re-weighed and the paperwork involved 2.4 identify the sources from which weight and balance information can be obtained 2.5 describe terms used in aircraft weight and balance calculations such as The Datum Line, The Monument, The Arm, Tare Weight, etc.

	2.6 discuss permanent and temporary ballast on aircraft 2.7 identify when objects have a positive or negative arm when performing calculations 2.8 describe the procedures used to calculate a weight and balance check given limited information on both conventional and tricycle type undercarriage 2.9 identify who obtains amended weight and balance information 2.10 describe where new weight and balance documentation is found in an A.M.O.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Identify aircraft hardware codes and part numbers associated with common aircraft bolts, washers and nuts. This section includes the use of aircraft parts manuals and helicoil installation procedures.	3.1 identify aircraft bolts by their respective head marks 3.2 describe three types of material used to manufacture aircraft bolts 3.3 discuss where specific types of aircraft bolts are used in specific areas of aircraft assembly 3.4 identify both JO-BOLTS and Lock Bolts 3.5 describe the various types of aircraft nuts and washers using both letter and number codes 3.6 describe, given a number of aircraft hardware items, the part number associated with the item - i.e. AN9-C-H-17A 3.7 describe how to install Heli Coils 3.8 discuss how to obtain specific hardware using an aircraft parts catalogue and stores requisition form 3.9 discuss the advantages of using JO-BOLTS instead of other aircraft hardware 3.10 identify temperature restrictions on self-locking aircraft nuts 3.11 describe when and where to use lock washers 3.12 discuss the purpose of cotter pins

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Test 6: Aircraft Structures	50%
Test 7: Aircraft Weight and Balance Control	25%
Test 8: Aircraft Hardware	25%

Date: August 29, 2019

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.