Модуль 1. Курс 5. Група 753 лм. НТТ (Technical aviation advanced).

1. Зробіть переклад українською поданого тексту авіаційної спрямованості:

9.1. INTRODUCTION TO TAILPLANE DESIGN, CONTROL SYSTEMS AND STABILIZATION

The functions allotted to the fixed and movable tail surfaces are as follows:
a. To ensure equilibrium of moments in steady flight by exercising a force at a given distance from the center of gravity.
b. To ensure that this equilibrium is stable, which implies that arter a disturbance the equilibrium is restored and that there is adequate damping for the rapid suppression of oscillations.
c. To generate forces for maneuvering the aircraft: rotation during takeoff, control of the flight path, flareout during landing and taxying.

These useful attributes are counteracted to some extent by a large item on the debit side. Although the total tail surface area of small aircraft will not exceed some 25 to 30 percent of the wing area, ratios of 40 to 50 percent are no exception in the case of some high-speed and STOL aircraft. In cases like these the structural weight and drag reach such high values that it will unquestionably prove worthwile to investigate how the tail surfaces can be reduced to a minimum during the preliminary design stage.

The tailless aircraft shows that the functions of the horizontal tail may be taken over by other elements, nor will it always be necessary to locate the tail surfaces behind the wing. The canard type of configuration is sometimes adopted to obtain particular characteristics. Section 2.6.3. shows why this rather unconventional configuration may sometimes have certain advantages. It will henceforth be assumed that the arrangement of the empennage has (provisionally) been decided upon, for example on the basis of the considerations dealt with in Section 2.4. Using the methods given it will nevertheless be possible to obtain a general idea of the influence which the location of the horizontal tail surface will have on its dimensions. A final decision cannot be taken until the structure has been fully developed.

A survey of some methods which enable the designer to size the tail surfaces and determine their principal characteristics will be presented here, taking a number of important design criteria as point of departure. The survey makes no claim to completeness, and the approach recommended is not necessarily representative of that chosen in most design departments. In many cases the knowledge gained through experience, as well as the designer's own intuition, may play a much more important role than may be evident from the present text. Apart from some rather detailed procedures fast, simple methods are also given for a first estimation of the size and shape of the tailplane.

2. Перекладіть українською мовою наступні терміни:
truss-type fuselage, tension, compression, torsion, shear, bending, riveted plate, applied loads, pressurization, wing tip, trailing edge, Inverted gull, longitudinal stiffeners, lower cap member, fail-safe spar web design, continuous gusset, stressed-skin design, outboard flap, tail cone, orange peel cowling, primary flight control surfaces, deflect the rudder.

3. Вставити пропущені слова в реченнях:

1. The most common aircraft is the _____ aircraft.
2. The airframe of a fixed-wing aircraft consists of five principal units: the fuselage, wings, stabilizers, flight control surfaces, and _____.
3. The earliest aircraft were constructed primarily of _____.
4. The main structural member in a wing is called the wing _____.
5. Aircraft structural members are designed to _____ a load or to resist stress.
6. There are five major stresses to which all aircraft are subjected: tension, compression, torsion, _____, bending.
7. Bending stress is a combination of _____ and tension.
8. Longerons usually _____ across several frame members and help the skin support primary bending loads.
9. A semimonocoque fuselage, because of its _____-skin construction, may withstand considerable damage and still
be strong enough to hold together.
10. The ribs give the wing its _____ shape and _____ the load from the skin and stringers to the spars.