GAU, School of Aviation, Aviation Management

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| **Course Unit Title** | | General Aeronautics | |
| **Course Unit Code** | | AVM407 | |
| **Type of Course Unit** | | Compulsory, Aviation Management | |
| **Level of Course Unit** | | 4rd Year BSc | |
| **National Credits** | | 3 | |
| **Number of ECTS Credits Allocated** | | 5 ECTS | |
| **Theoretical (hour/week)** | | 3 | |
| **Practice (hour/week)** | | - | |
| **Laboratory (hour/week)** | | - | |
| **Year of Study** | | 4 | |
| **Semester when the course unit is delivered** | | 7 | |
| **Course Coordinator** | |  | |
| **Name of Lecturer (s)** | |  | |
| **Name of Assistant (s)** | |  | |
| **Mode of Delivery** | | Face to Face | |
| **Language of Instruction** | | English | |
| **Prerequisites and co-requisites** | |  | |
| **Recommended Optional Program Components** | | Basic background of Aircraft structures and flight  principles | |
| **Objectives of the Course:** | | | |
| * Teaching an introduction to flight principles. * Teaching the basic components of an aircraft. * Teaching the fundamental working principles of an aircraft engine. * Teaching the basic control surfaces and forces. | | | |
| **Course Description** | | | |
| This course presents fundamental knowledge of lift and drag for aircraft, high speed sub sonic aerodynamics and the performance of aircraft particular emphasis on turbojet and turboprop aircraft with a maximum take- off weight (MTOW). | | | |
| **Course Contents** | | | |
| Week |  | | Exams |
| 1 | Introduction to Flight Theory, Atmosphere, Bernoulli Principles, Density, and temperature. | |  |
| 2 | Introduction to Airfoil Concepts: Airfoil Design, wing aerodynamics, relative wind and angle of  attack. | |  |
| 3 | Flight Principles: Forces acting on the Airplane, stall, pressure distribution | |  |
| 4 | Lift, Drag, and L/D calculations(Tutorial class) | |  |
| 5 | Impact of different surface and environmental parameters for aircraft performance | |  |
| 6 | Airplane Structures: Airplane Components, wing, empennage, power plant, fuselage, and  landing gear | |  |
| 7 | Exercises, Tutorials and Revision Class | |  |
| 8 | Midterm Exam | | Midterm |
| 9 | Incompressible flow around wings, Prandtl’s lifting line theory, induced angle and down-wash,  upswept wings, swept wings. | |  |
| 10 | Aircraft Stability and Control, primary control devices, secondary control devices, side effects,  positive, negative and neutral stability. | |  |
| 11 | Aircraft Propulsion system, Engine Types, How engine works. | |  |
| 12 | Introduction to Flight Mechanics: Take-off and Landing Performance | |  |
| 13 | Introduction to Flight Mechanics II: Climb Performance | |  |
| 14 | Revision, Exercises and Tutorial Class | |  |
| 15 | Final Exam | | Final |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Recommended Sources** |  |  |  |  |  | | **Textbook:** Gale Craig, “Introduction to Aerodynamics”, 1th edition, Regenerative Press, 2003.  **Supplementary Material(s):** John D. Anderson, “Fundamental of Aerodynamics”, 5th edition, Mc Graw Hill, 2011. | | | | | | | **Assessment** | | | | | | | Attendance | 5% |  |  |  |  | | Assignments | 15% |  |  |  |  | | Project-Seminar | 15% |  |  |  |  | | Midterm Exam | 20% | Written |  |  |  | | Quizzes | 10% |  |  |  |  | | Final Exam | 35% | Written |  |  |  | | Total | 100% |  |  |  |  | | **ECTS Allocated Based on the Student Workload** | | | | | | | Activities | | | Number | Duration (hour) | Total Workload(hour) | | Hours per week (Theoretical) | | | 15 | 3 | 45 | | Presenting of observations and tutorials as report | | | 5 | 5 | 25 | | Preparation of the homework | | | 5 | 5 | 25 | | Quizzes | | | 2 | 11 | 22 | | Supervision | | | 1 | 17 | 17 | | Final Exam | | | 1 | 22 | 22 | | Total Workload | | | | | 156 | | Total Workload/30 (h) | | | | | 5.2 | | ECTS Credit of the Course | | | | | 5 | | | | |