**GAU, School of Aviation, Civil Aviation and Cabin Services**

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| **Course Unit Title** | General Aircraft Knowledge |
| **Course Unit Code** | CACS105 |
| **Type of Course Unit**  | Compulsory, Civil Aviation and Cabin Services  |
| **Level of Course Unit**  | 1st Year  |
| **National Credits** | 3 |
| **Number of ECTS Credits Allocated** | 5 ECTS |
| **Theoretical (hour/week)** | 3 |
| **Practice (hour/week)** | - |
| **Laboratory (hour/week)** | - |
| **Year of Study** | 1 |
| **Semester when the course unit is delivered** | 1 |
| **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 Programme 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.
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| **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 | Summary of Aviation History |  |
| 2 | Introduction to Flight Theory, Atmosphere, Bernoulli Principles, Density, and temperature. |  |
| 3 | Introduction to Airfoil Concepts: Airfoil Design, wing aerodynamics, relative wind and angle of attack. |  |
| 4 | Flight Principles: Forces acting on the Airplane, stall, pressure distribution, 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”, 1st edition, Regenerative Press, 2003.**Supplementary Material(s):** John D. Anderson, “Fundamental of Aerodynamics”, 5th edition, Mc Graw Hill, 2011. |
| **Assessment** |
| Attendance | 5% |  |
| Assignments | 45% |  |
| Project-Seminar | 0% |  |
| Midterm Exam | 45% | Written |
| Quizzes | 0% |  |
| Final Exam | 50% | 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 |
| Mid Term | 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 |