



COURSE OUTLINE

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|-----------------------|----------------------------------------------|
| COURSE TITLE: | Introduction to Aerospace Engineering |
| COURSE CODE: | L03117X |
| CREDIT POINTS: | 2 |
| CONTACT HOURS: | 32 (32 lectures) |
| LEVEL: | Electives, 3 th semester |
| DELIVERY: | Lectures |

Course Description:

The course provides the basic theory of flight. Students are introduced to aircraft primary structure, flight controls, aerofoil, and aerodynamic forces. The course discusses the four forces acting on an airplane during flight, aircraft performance basics, and weight and balance.

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1. Understand the aircraft flight theory, aircraft performance, aircraft stability and manoeuvrability.
2. Know the basic principles and concept of aircraft engines, special equipment, instruments and others.
3. Discuss aircraft special equipment, instruments and Systems.

Course Content:

Basic quantities, equilibrium conditions, properties of the atmosphere, continuity equation, and terminology associated with aircraft speed; aircraft primary structure, stability, and flight controls. Types of aerofoil and forces acting on an aerofoil, four forces acting on an aeroplane during flight, and formation of shock waves and their effect on high speed aircraft; Introduction to helicopter theory and aircraft propulsion; Fundamental aerodynamic problems and aerodynamics of multi-engine flight operations

Aircraft performance, performance charts, effect of high speed and high altitude on aircraft performance and maneuverability; Aircraft weight and balance considerations.

Textbooks and Reference Materials:

1. Xie Chu, Jia Yuhong et al. *Introduction to Aerospace Technology*. Beijing, Beijing Aerospace and Astronautics Press, 2004. ISBN: 9787811244281.
2. He Qingzhi et al. *Introduction to Aerospace*. Beijing: Beijing Aerospace and Astronautics Press 2004. ISBN: 781012701.



3. Kermode, A.C., Barnard, R.H., & Philpott, D.R (2006). *Mechanics of flight* (11TH Edition), New Jersey, Prentice Hall.



COURSE TEACHING PLAN

Lectures and Tutorials

| Serial No. | Contact Hours | Topic | Remark |
|------------|---------------|-----------------------------------------------------------------------------------------------------|--------|
| 1 | 2 | Introduction | |
| 2 | 0.5 | Aircraft flight environment | |
| 3 | 0.5 | The basic concepts of the gas flow | |
| 4 | 0.5 | The aerodynamics on the aircraft | |
| 5 | 0.5 | The flight performance, stability, maneuverability of aircraft | |
| 6 | 1 | Classification of modern flight | |
| 7 | 1 | The application of modern military aircraft | |
| 8 | 1 | The application of modern civil aircraft | |
| 9 | 2 | Other kinds of Aircraft | |
| 10 | 1 | The structures and materials of aircraft | |
| 11 | 1 | The basic structure of Aircraft | |
| 12 | 1 | Classification of the propulsion system | |
| 13 | 1 | Piston engines, jet engines | |
| 14 | 1 | Aircraft instrument and display systems, electromechanical systems | |
| 15 | 1 | Aircraft environmental control systems, life support systems, communications and navigation systems | |
| 16 | 1 | Aircraft weapons systems, automatic control systems | |
| 17 | 0.5 | Ground support systems | |



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| 18 | 0.5 | Air traffic management | |
| 19 | 0.5 | Aircraft development process | |
| 20 | 0.5 | The technical characteristics of aerospace manufacturing | |
| 21 | 2 | The application of modern spacecraft | |
| 22 | 2 | Spacecraft flight principle | |
| 23 | 0.5 | Astronaut system | |
| 24 | 0.5 | the spacecraft applications | |
| 25 | 0.5 | manned spacecraft systems | |
| 26 | 0.5 | launch vehicle systems | |
| 27 | 0.5 | launch site systems | |
| 28 | 0.5 | monitoring and control communication system | |
| 29 | 1 | the return landing system | |
| 30 | 2 | Aircraft components and functional applications | |
| 31 | 2 | Aircraft structure and systems analysis | |
| Total | 32 | | |

Type of Assessment

The contents of test/examination/assignment will be from lectures and recommended reference reading material.

| Attendance | Tests | Homework | Final report or project |
|------------|-------|----------|-------------------------|
| 30% | 20% | 20% | 30% |

Developed by: [Faculty of Aerospace Engineering](#)

Date: 03.June 2013

Approved by: Academic Committee of College of International College

Date: 03. July 2013
