Tamkang University Academic Year 108, 1st Semester Course Syllabus

Course Title	AIRCRAFT PERFORMANCE ANALYSIS	Instructor	TYAN FENG
Course Class	TENXB3P DEPARTMENT OF AEROSPACE ENGINEERING, 3P	Details	◆ General Course ◆ Selective ◆ One Semester

Departmental Aim of Education

Ⅰ. Apply scientific knowledge and engineering techniques to analyze and solve fundamental aerospace engineering problem.

Ⅱ. Through fundamental theory to design and implement experiments, and be able to analyze experimental data.

Ⅲ. Maintain the spirit of independent thinking, self-elevate, and continuous learning.

Ⅳ. Uphold the responsible attitude of work ethics and team work.

Ⅴ. Will have access to information, using basic knowledge, diversification, and better ability to adapt to circumstances.

Subject Departmental core competences

A. With basic aerospace engineering expertise.(ratio:30.00)

B. Able to solve basic engineering problems via fundamental theory.(ratio:20.00)

C. Capable of lifelong learning and research capacity for further studies.(ratio:10.00)

D. To work with a sense of mission and responsibility.(ratio:10.00)

E. Have team spirit and the ability to communicate with each other.(ratio:10.00)

F. With an international perspective, have the ability to connect with the world.(ratio:10.00)

G. Taking full advantage of information and utilization of computer-assisted problem solving skills.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:50.00)

3. A vision for the future. (ratio:10.00)

5. Independent thinking. (ratio:30.00)

Course Introduction	The purpose of this course is to understand and predict how the airplane will actually perform in the air in order to achieve a desired performance or mission. □ How fast can the a/c go? □ How high can it go? □ How much (weight) can it carry? □ How far can it go without refueling? □ How steep (or how quickly) can the a/c climb?

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.

II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.

III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	The general performance problem. Understand performance Characteristics, Absolute Performance Characteristics and Functional Performance Characteristics	Cognitive
2	Equations of Motion. Understand general information and setup the Energy Approach.	Cognitive
3	The basics. Setup fundamental performance equation. Understand stalling speed, maximum velocity, ceiling and gliding flight.	Cognitive
4	Climbing flight. Understand rate of climb angle, time to climb, shallow flight paths, load factor (n is not equal to 1), partial power and excess power considerations.	Cognitive
5	Range and Endurance. Use approximate, but most used methods, range integration method to determine range and endurance. Consider the effect of wind.	Cognitive
6	Nonsteady Flight in the Vertical Plane. Take off analysis, landing and accelerating flight.	Cognitive
7	Maneuvering flight. Turns in vertical plane, V n diagram, turning flight in horizontal plane, maximum sustained turning performance and the maneuvering diagram.	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment				
No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEFG	1235	Lecture, Discussion	Testing, home work
2	ABCDEFG	1235	Lecture, Discussion, Practicum	Testing, home work
3	ABCDEFG	1235	Lecture, Discussion	Testing, home work
4	ABCDEFG	1235	Lecture, Discussion	Testing, home work
5	ABCDEFG	1235	Lecture, Discussion	Testing, home work
6	ABCDEFG	1235	Lecture, Discussion	Testing, home work
7	ABCDEFG	1235	Lecture, Discussion	Testing, home work

Course Schedule			
Week	Date	Course Contents	Note
1	108/09/09 ~ 108/09/15	The general performance problem	
2	108/09/16 ~ 108/09/22	Equations of motion	
3	108/09/23 ~ 108/09/29	The Basics	
4	108/09/30 ~ 108/10/06	The Basics	
5	108/10/07 ~ 108/10/13	Climbing Flight	
6	108/10/14 ~ 108/10/20	Climbing Flight	
7	108/10/21 ~ 108/10/27	Range and Endurance	
8	108/10/28 ~ 108/11/03	Range and Endurance	
9	108/11/04 ~ 108/11/10	Range and Endurance	
10	108/11/11 ~ 108/11/17	Midterm Exam Week	
11	108/11/18 ~ 108/11/24	Nonsteady Flight in Vertical Plane	
12	108/11/25 ~ 108/12/01	Nonsteady Flight in Vertical Plane	
13	108/12/02 ~ 108/12/08	Nonsteady Flight in Vertical Plane	
14	108/12/09 ~ 108/12/15	Maneuvering Flight	
15	108/12/16 ~ 108/12/22	Maneuvering Flight	
16	108/12/23 ~ 108/12/29	Maneuvering Flight	

17	108/12/30～ 109/01/05	Additional Topics (if time allows)	
18	109/01/06～ 109/01/12	Final Exam Week (Date:109/1/3-109/1/9)	

Requirement	Work hard
Teaching Facility	Computer, Projector, Other (MATLAB, ADAMS)
Textbooks and Teaching Materials	Maido Saarlas, "Aircraft Performance," John Wiley & Sons, 2007
References	A.K. Kundu, M.A. Price and D. Roordan, "Theory and Practice of Aircraft Performance," Wiley, 2016 J.D. Anderson, "Aircraft Performance and Design," WCB McGraw-Hill, 1999. M.H. Sadraey, "Aircraft Performance, An Engineering Approach," CRC Press, 2017
Number of Assignment(s)	8 (Filled in by assignment instructor only)
Grading Policy	◆ Attendance： % ◆ Mark of Usual：15.0 % ◆ Midterm Exam： 35.0 % ◆ Final Exam： 50.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**