[Course Title]: Gas Turbines and Jet Propulsion

[Course Code]: MECH3660

[No. of Credits]: 3

[Any pre-/co-requisites]: (MATH2111 OR MATH2350 OR MATH2351) AND MECH3640

Name: [Instructor(s) Name] ZHANG, Xin & ZHOU, Peng

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Course Description

[Briefly describe the course content, key topics or themes, objectives, methods of instruction, e.g., lectures, discussions, projects].

The course will cover jet propulsion, gas turbine, engine types, performance, turbojet, turboprop, E-propulsion engines, designs of compressor, combustor, and turbines, and environmental considerations. For science and engineering students in their third year of study or above.

Course Topics:

1. Introduction to jet propulsion and engine classification
2. Aerodynamics
3. Performance metrics
4. A case study
5. Numbering and certification
6. Intake
7. Nozzle
8. Ramjet
9. Turbojet
10. Turbofan
11. Bypass ratio
12. Dynamic scaling and non-dimensional analysis
13. Compressor
14. Combustion
15. Turbine
16. Turboprop
17. Rocket
18. E-propulsion
19. Environmental Consideration: aircraft/ engine noise

Course Objectives:

1. Students will establish understanding of propulsion systems in aircraft that are essential to graduate engineers who are intended to work in aircraft system/component manufacturing/maintenance environments. [P-01, P-02]

2. Students should be able to describe and appreciate the key aeronautical engineering features of the context in which the relevant industry operates. [P-03, P-04]

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage]

Assessment Task	Contribution to Overall Course grade (%)
Mid-Term	30%
In-course essay	0
Group Project	0
Final examination	70%

Required Texts and Materials

[List required textbooks, readings, and any other materials]

1. "Jet Propulsion" by Nicholas Cumpsty and Andrew Heyes, 3rd ed., Cambridge University Press, 2015

2. Class notes

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]