PAE3I102 AERO THERMODYNAMICS

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UNIT I. BASIC THERMODYNAMICS

Systems, Zeroth Law, First Law - Heat and work transfer in flow, Second law, Clausius statement - concept of entropy entropy change in non-flow processes.

UNIT II. AIR CYCLES

Otto, Diesel, Dual combustion and Brayton combustion cycles – Air standard efficiency - Mean effective pressure – Actual and theoretical PV diagrams of two stroke and four stroke IC Engines, cycle for Jet propulsion and Rocket Propusion.

UNIT III. THERMODYNAMICS OF ONE DIMENSIONAL FLUID FLOW

Application of continuity, momentum and energy equations- Rankine cycle - Isentropic flow of ideal gases through nozzles - Simple jet propulsion system - Thrust rocket motor – Specific impulse.

UNIT IV. REFRIGERATION AND AIR COMPRESSORS

Principles of refrigeration, Air conditioning - Heat pumps - Vapour compression - Vapour absorption types - Coefficient of performance,. Classification and working principle of compressors

UNIT V. STOICHIOMETRY, FUELS AND COMBUSTION

Basic of Stoichiometry in chemical reaction, Limiting reactant, exess rectatnt, , Clasification of fuels, Combustion reaction, fuel-air ratio, Aplication of Stoichiometry in combustion calculation

TEXT BOOKS

1. Rathakrishnan, E, “Fundamentals of Engineering Thermodynamics”, Prentice – Hall, India, 2000
2. Nag. P.K., “Engineering Thermodynamics”, Tata McGraw-Hills Co., Ltd., Seventh Edn., 1993
3. Yunus A.Cengal. “Thermodynamics an Engineering Approach”, Tata McGraw-Hill Co. Ltd., 3rd Edition, 2002.
4 D. P. Mishra, Fundamentals of Combustion, Prentice Hall of India, New Delhi, revised edition, 2010.
5 v. Ganesan, Internal Combustion Engines, Tata McGraw-Hills Co

REFERENCES

1. Mayhew, A. and Rogers, B., “Engineering Thermodynamics”, Longman Green & Co. Ltd., London, E.L.B.S. Edition, 1990.
2. Van Wylen, G.J. and Sonntag, R.E., “Fundamentals of Classical Thermodynamics (S.I.Version)”, Second Edition, 1986.
3. Bacon, D.H., “Engineering Thermodynamics”, Butterworth & Co., London, 1989.
5. D. P. Mishra, Engineering Thermodynamics, Cengage Learning India Pvt. Ltd, 2011.