

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MANUFACTURING ENGINEERING**  
**B. E. SEMESTER: III**

Subject Name: **Thermodynamics and Thermal Engineering**

Subject Code: **133401**

<b>Sr. No</b>	<b>Course Content</b>
1.	<b>Basic Thermodynamics:</b> Systems – Zeroth law – First law – Steady flow energy equation – Heat and work transfer in flow and non-flow processes – Second law – Kelvin-Planck statement – Clausius statement – Concept of Entropy Clausius inequality – Entropy change in non-flow processes – Properties of gases and vapours.
2.	<b>Air Standard Cycle And Compressors:</b> Otto – Diesel – Dual combustion and Brayton cycles – Air standard efficiency – Mean effective pressure – Reciprocating compressors.
3.	<b>Steam And Jet Propulsion:</b> Properties of steam – Rankine cycle – Steam Nozzles – Simple jet propulsion system – Thrust rocket motor – Specific impulse.
4.	<b>Refrigeration And Air-Conditioning:</b> Principles of psychrometry and refrigeration – Vapour compression – Vapour absorption types – Coefficient of performance – Properties of refrigerants – Basic Principle and types of Air conditioning.
5.	<b>Heat Transfer:</b> Conduction in parallel – Radial and composite wall – Basics of Convective heat transfer – Fundamentals of Radiative heat transfer – Flow through heat exchangers.  (Standard thermodynamic tables, Mollier diagram and Refrigerant property tables may be used)

**Text Books:**

1. Nag.P.K., “Engineering Thermodynamics”, Tata McGraw-Hill, 2007.
2. Radhakrishnan E., “Fundamentals of Engineering Thermodynamics”, Prentice-Hall India, 2005.
3. Rajput R. K., “Thermal Engineering”, Laxmi Publications (P) Ltd, 2010.

**Reference Books:**

1. Ramalingam K.K. "Thermodynamics", Sci-Tech Publications, 2006.
2. Holman.J.P., "Thermodynamics", 3rd Edition, McGraw-Hill, 2007.
3. Arora C.P, "Thermodynamics", Tata McGraw-Hill, 2003.