

Course Number and Name	
BME402 - THERMAL ENGINEERING - I	
Credits and Contact Hours	
4&60	
Course Coordinator's Name	
Mr.Srinivasan	
Text Books and References	
<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. R.K.Rajput, Thermal Engineering, Dhanpat Rai publishers, 2008 2. S.Domkundwar-Thermal Engineering-Dhanpat Rai publishers,2000 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. P.K.Nag, Basic & Applied Thermodynamics-Tata McGraw Hill, 2002 2. Yunus A.Cengel-Thermodynamics-International Edition, 2006. 3. engg-ebook.blogspot.in › ... › r k rajput › sem 4 › thermal engineering 	
Course Description	
<p>To integrate the concepts, laws and methodologies from the first course in thermo dynamics into analysis of cyclic processes</p> <p>To apply the thermodynamic concepts into various thermal application like IC engines, Steam Turbines, Compressors and Refrigeration and Air conditioning systems</p>	
Prerequisites	Co-requisites
Thermodynamics	Nil
required, elective, or selected elective (as per Table 5-1)	
Required	
Course Outcomes (COs)	
CO1	Upon completion of this course, the students can able to apply the different gas power cycles
CO2	Use of them in IC and R&AC applications.
CO3	Study of Steam Turbines
CO4	Study of vapour power cycles
CO5	Study of rankine power cycles and its application
CO6	Understand the concept of refrigeration and its application

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	H	M	H			L	L	L	L	L	L	H
CO2	H	M	H			L	L	L	L			H
CO3	H	M	M									
CO4	H	M	H			L	L	L	L			
CO5	H	M	H									H
CO6	H	M	H			L	L	L	L			H

List of Topics Covered

UNIT I STEAM NOZZLES

12

Flow of steam through nozzles, Shape of nozzles, Effect of friction, Critical pressure ratio, Super saturated flow

UNIT II STEAM TURBINES

12

Working principles, Simple impulse(De laval) turbine, Reaction turbine, velocity and pressure compounded turbines, Height of blades of turbines, multi stage turbine, Radial flow turbines, Governing of steam turbines(Derivations not included)

UNIT III AIR POWER CYCLES

12

Construction & working of 2 stroke and 4 stroke engines, Otto, Diesel and dual cycles-air standard efficiency, Mean effective pressure and power, Brayton with reheat, intercooling and regeneration, Ericsson, Stirling, Atkinson cycles.

UNIT IV VAPOUR POWER AND COMBINED CYCLES

12

Rankine, Modified Rankine, Reheat, Regeneration cycles, Binary vapour power cycles, Cogeneration principles & Applications.

UNIT V REFRIGERATION CYCLES

12

Air refrigeration cycles, Vapour compression refrigeration cycle, sub cooling and superheating cycles, vapour absorption cycles.