

SRM University
M.Tech Automotive Hybrid Systems Engineering
 (Collaborative program with NFTDC, Hyderabad)
 (Proposed syllabus from the academic year 2015-16)

Supportive courses

		L	T	P	C
AH 2193	COMBUSTION THERMODYNAMICS AND HEAT TRANSFER	3	0	0	3
	(for non-mechanical engineering graduates)				
	Total Contact Hours-45				
	Prerequisites				
	Nil				
PURPOSE					
To study the thermodynamics in combustion and the heat transfer.					

Thermodynamics of actual working fluids:

Working before combustion, thermodynamic properties of fuel air mixture before combustion , use of combustion charts for fuel air mixture, thermodynamics of combustion, approximate treatment of fuel air mixtures.

Fuel air cycles:

Definition, constants, volume fuel air cycle, limited pressure cycle, characteristics of fuel air cycles, comparison of real and fuel cycles. Comparison on real and fuel air cycles.

Air capacity of four stroke engines:

Ideal air capacity , volumetric efficiency, ideal induction process, actual induction process, effect of operating conditions on volumetric efficiency, effect of design on volumetric efficiency, estimating air capacity.

Two stroke engines:

Scavenging process, ideal scavenging process, relationship of scavenging ratio and scavenging efficiency, power to scavenger, supercharged two stroke engines.

Combustion and detonation:

chemistry of combustion, normal combustion in S.I engines, pre ignition and auto-ignition compared, detonation in S.I engines, combustion in C.I engines, detonation in C.I engines, effect of design on detonation. Methods of reducing detonation, preliminary detonation, preliminary facts about fuel and dopes, octane and cetane numbers

Heat losses and cooling:

Area of heat flow engines, temperature profile, engine cooling system.

Engine design:

Selection of type, engine speed and principles of similitude, determination of main dimensions.

Mixture requirements:

Steady running mixture requirements, transient mixture requirements, mixtures requirements fuel injection engines, mixture requirements for S.I engines.

Performance of supercharged engines:

Engine Performance Measure, Commercial, Engine Ratings, Basic Performance Equations for unsupercharged engines, effect of atmospheric conditions, altitude and compression ratio on performance characteristics, performance curves.

Supercharged engines:

Definition Reasons for supercharging, supercharging of S.I engines, supercharging of diesel engines.

References:

1. Sarkar B.K., *Thermal Engineering* , Tata McGraw Hill Co. Ltd., India, 1999.
2. Rayner & Joel, *Basic Engineering Thermodynamics*, Addison Wesley Publishing Company Ltd., 5th Edition, 1996.
3. Nag.P.K., *Engineering Thermodynamics*, Tata McGraw Hill Co. Ltd., India, 1995.
4. Rajput R.K., *Thermal Engineering*, Laxmi Publications (P) Ltd., New Delhi, Edition. 2001.