## OFFICE OF THE DEAN (RESEARCH & CONSULTANCY) NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA-136119

No. Dean (R&C)/19/

Dated: 19.11.2019

The Department of Mechanical Engineering has created state-of-the-art research & testing facilities in Advanced Thermal Engineering lab. These testing facilities are available to the external users at the charges mentioned below:

CONSULTANCY/TESTING CHARGES FOR VARIOUS EQUIPMENTS (w.e.f.1st November, 2019)

Charges for educational & research organizations (External)	Charges for private industry/ PSU/ Non-Educational Org.
Rs. 7000/Sample	Rs. 10000/Sample
annonneter (Max. Lorg cx: rated power 100 kW cylinder CRDI Turbo 6 0cc. ents can be conducted rall analysis of any type eriment on effect of any eriment on blow by of a	unit Eddy current dyn 1500to 2400 RPM, Me 6000 RPM) Engine 4 Maruti of capacity 120 * To perform ovi on an engine.
Rs. 7000/Sample	Rs. 10000/Sample
Rs. 7000/Sample	Rs. 10000/Sample
	Charges for educational & research organizations (External) Rs. 7000/Sample Rs. 7000/Sample

<ul> <li>Specific fuel consumption</li> </ul>		
Air to fuel ratio	DEFICE OF THE DE.	
Heat balance		
Combustion analysis	D = = 0.001/0 = 1	D 10000/0 1
Computerized3 cylinder, 4 stroke, Petrol Engine, Power: 27.6 kW @ 5000 RPM, CR: 9.2, Bore Dia.: 66.5 mm, Stroke: 72 mm, Swept Volume: 796 cc.	Rs. 7000/Sample	Rs. 10000/Sample
<ul> <li>The following experiments can be conducted:-</li> <li>To study the performance of 3 cylinders, 4 stroke petrol engine connected to dynamometer in computerized mode with open ECU.</li> </ul>	anical Engineering has These testing faoilitit	e Department of Mech ermal Engineering lab ow: CONSULTANCVO
<ul> <li>To study the performance of 3 cylinders, 4 stroke petrol engine connected to dynamometer in manual mode.</li> <li>To draw pressure –crank angle plot, pressure volume plot and calculate indicated power of the engine.</li> <li>To study the maximum power generated by the engine.</li> </ul>	Setup/Facilities	
<ul> <li>To study the BSFC and brake thermal efficiency.</li> <li>To performMorse test.</li> </ul>		
Engine Test Bed with Eddy Current Dynamometer, Gravimetric Fuel Consumption Meter and Universal engine mounting. The test bed is pre equipped with 4 cylinder CRDI Turbo charged diesel.	Rs. 12000/Sample	Rs. 15000/Sample
Provisions of engine blow by and coolant conditioning unit.Eddy current dynamometer (Max. torque 400 NM @ 1500to 2400 RPM, Max: rated power 100 kW@ RPM 2400 to 6000 RPM).Engine 4 cylinder CRDI Turbo diesel engine of Maruti of capacity 1200cc.	a.: 87.5 mm, Stroker 1 h be operated with petro o vary Compression Rat	a 1800 RPM, Bore D catures:- * Same engine ca with provision 1
The following experiments can be conducted:- To perform overall analysis of any type of IC engine.		SI mode and 12 Computerized i
<ul> <li>To perform experiment on effect of any type of coolant on an engine.</li> </ul>		Computerized v     Exhaust gas cal
<ul> <li>To perform experiment on blow by of an engine.</li> </ul>		
<ul> <li>To perform experiment on emission analysis of an</li> </ul>	nt system engine/ Vi	mission Measureme
engine	D 4600/0 1	D 2200/G
Computerized Bomb Calorimeter	Rs. 1600/Sample	Rs 3200/Sample
Features:- To determine heat of combustion of solid and liquid fuels	VCR Engine Test	omputerized CRD
namely coal, agro fuels, Dry black liquor and furnace oil.	D (00/0 1	D 1200/6
Computerized Fuel Viscometer Features:-	Rs.600/Sample	Ks 1200/Sample
The second secon	irs can be studied -	he following paramete
<ul> <li>To measure the viscosity of various kinds of hunds such as bio-fuels, petrol, dieseletc.</li> <li>To determine the viscosity resistance and absolute</li> </ul>		<ul> <li>Indicated power</li> </ul>
<ul> <li>To measure the viscosity of various kinds of huids such as bio-fuels, petrol, dieseletc.</li> <li>To determine the viscosity resistance and absolute viscosity of the liquids.</li> <li>Measurement range is 100000 MPA with 4</li> </ul>	selive pressure	Indicated power     Frictional power     Brake mean eff
<ul> <li>To measure the viscosity of various kinds of huids such as bio-fuels, petrol, dieseletc.</li> <li>To determine the viscosity resistance and absolute viscosity of the liquids.</li> <li>Measurement range is 100000 MPA with 4 spindles, 6/12/30/60 rotor speed (rpm), + 5 % Newtonian fluid</li> </ul>	edive pressure effective pressure fileiency	<ul> <li>Indicated power</li> <li>Frictional power</li> <li>Brake mean off</li> <li>Indicated mean</li> <li>Brake thermal a</li> </ul>

AVL FIRE (Engine combustion software for diesel	Rs. 1000/hr	Rs. 2000/hr
/Gasoline / Gas engines and sub systems for parts design	ny type of internal comit	Fo analyze flue gas of a
optimization through build in function /subroutines /		
library functions)	there are like CO.	-calures:-
Main features	a na ann anna a sao	00
<ul> <li>CAD data import and manipulation</li> </ul>		Data acquisition syste
automated grid generation, resulting insither		
- automated grid generation resulting mether		
<ul> <li>hexanedron-dominated or</li> </ul>		
<ul> <li>tetrahedron-dominated grids</li> </ul>		ST extra as applicabl
<ul> <li>setup and handling of models with (multiple) moving</li> </ul>	and harmonication with	
boundaries	and manifestings and filting	ne externat users for an
<ul> <li>includes a series of tools for grid, surface and edge</li> </ul>		Dr. Rajacesh
model manipulation		Prof. in-charge Therm
To study & simulate		Mechanical Engineeri
1. In-cylinder Analysis		VIT Karnisherra
2. Engine Thermal Analysis		Context No. 01744-23
4. Port Flow Optimization		
- 5. Intake System CFD Simulation		
6. Intake Manifold Simulation, EGR Distribution		
7. Exhaust Manifold flow Simulation		Prof. In-Charge (CCN)
8. Exhaust after Treatment Flow Analysis		
9. Quenching Simulation	D 1000/0	
To perform analysis of the engine running on bio-fuels	Rs. 4000/Sample	Rs. 8000/Sample
to perform analysis of the engine running on bio-rucis		
Features:-		
To make a heat balance sheet.		
• 10 conduct the experiments on different types of bio-		
Steam turbine test rig	Rs 2500/Sample	Rs 4000/Sample
To measure the steam turbine efficiency, steam quality, flow	Rs. 2500/54mple	RS. 4000/Sample
rate and condenser effectiveness. Steam Turbine Capacity: 2		
kW, Boiler capacity: 400 kg/hr, at 15 kg/cm <sup>2</sup> .		
Features:-		
<ul> <li>To find the line steam quality.</li> </ul>		
• To find the isentropic work produced by turbine.		
<ul> <li>To perform the demonstration of Rankine cycle</li> <li>operated thermal power plant</li> </ul>		
Bio-gas analyzer	De 1600/Sample	De 2200/Samala
To analyze biogas with digital hand held portable biogas	ns. 1000/sample	RS 5200/Sample
analyzer.		
Frates		
To measure the contents of his sec	Carl Street Street	
To measure the contents of ologas		

Rs. 1600/Sample	Rs 3200/Sample
es and sub systems	
build in function	
A	-
Rs. 1600/Sample	Rs 3200/Sample
	Rs. 1600/Sample Rs. 1600/Sample

## GST extra as applicable

The external users for availing the concerned facilities may contact at the address mentioned below.

Dr. Rajneesh Prof. in-charge Thermal Lab. Mechanical Engineering Department NIT Kurukshetra Email: <u>rajneesh@nitkkr.ac.in]</u> Contact No. 01744-233522



Prof. In-Charge (CCN) with a request to uploaded on Institute website.

Committee

- To make a heat balance sheet.
- To conduct the experiments on different types of bid fuels.

Steam inrbine test rig-

To measure the steam turbine efficiency, steam quality. flow rate and condenser effectiveness. Steam Turbine Capacity: I kW, Boiler capacity: 400 kg/hr, nt 15 kg/cm<sup>2</sup>.

- To find the line steam quality,
- To find the isentropic work produced by turbine.
- To perform the demonstration of Rankine evioperated thermal power plant

Bio-gas analyzer-

Fo analyze biogas with digital hand held portable bioga malyzer.

eatores;-

To measure the contents of biogest