Course Type	Course Code	NameofCourse	L	T	P	Credit
DP	NFMC524	Thermochemical Conversion Lab	0	0	3	1.5

CourseObjective
The course aimstogiveinformationaboutthe thermal response of various relevant fuels.
LearningOutcomes
Attheend ofthe course,studentswill gethands-on knowledgeabout the • Pyrolysis • Combustion and • Gasification characteristics of relevant fuels.

Exp. No.	Name of Experiment	Practical Hours	LearningOutcome
1	Introduction to the basics of the Thermochemical Conversion Lab	3	Basic understanding of the lab manual and lab procedures. Lab guidelines.
2	Proximate TGA analysis of a biomass sample	3	Composition of biomass.
3	Ultimate analysis of a biomass sample	3	Elemental composition of biomass.
4	TGA of a biomass sample under an inert environment	3	Devolatilization kinetics.
5	TGA of char-oxidation.	3	Kinetics of char-oxidation.
6	TGA of char-gasification.	3	Kinetics of char-gasification.
7	Determination of GCV of two different gaseous fuels.	3	Knowledge of variation in GCV with H/C ratio.
8	Examining the shape of a premixed flame	3	Knowledge about laminar burning velocity.
9	Determining laminar premixed flame velocity of different gaseous fuels	3	Impact of fuel on the laminar burning velocity
10	Determining the non-premixed flame length of different gaseous fuels	3	Impact of fuel on the non-premixed flame length
11	Determining the ash composition of solid fuels	3	Knowledge of analyzing XRF and XRD data of ash. Properties of coal and biomass ash.
12	Ash fusion temperature analysis of solid fuel's ash samples	3	Knowledge about differences in the AFT of a coal and biomass sample.
13	Giesler Plastometer Test	3	Plasticity of coal
14	Viva Voce	3	Students understanding of the course will be gauged based on a Viva voce.
Total		**42**	

Text Book:

1. An Introduction to Combustion: Concepts and Application, McGraw Hill Education, 3rd Ed., *Author*: Stephen R. Turns.

Reference Book:

1. Lab Manual of the Thermochemical Conversion Lab at the FMME Department in IIT ISM Dhanbad.