

Syllabus for B.Tech – Energy Engineering

Course Number & Title: EN204 – Fuels, and Combustion Engineering	
L-T-P-C: 3-0-0-6	
Offered to: B.Tech in Energy Engineering	
Offered in (Odd/ Even / Any): Semester III	
Offered by (Name of Department/ Center): School of Energy Science & Engineering	
Pre-Requisite: Nil	
Preamble / Objectives (Optional): This course is an introductory course on various fuels and combustion chemistry. It covers fundamental aspects of combustion, combustion related problems and an understanding on the combustion principles. Overall, the course aims to provide an understanding on fossil fuels, their properties, thermodynamics and reaction kinetics of combustion, and problems solving.	
Course Content/ Syllabus: Fuel properties and composition: solid, liquid and gaseous fuels: composition, and its properties, fuels for power generation and production of chemicals, Coal: properties, processing: briquetting, carbonization, gasification and liquefaction, coal derived chemicals, reserve and resource analysis, petroleum: composition, classification, and grading; extraction techniques, processing techniques: distillation of crude, petroleum products, purification methods, combustion: chemistry and stoichiometric calculation, thermodynamic and kinetic analysis, premixed and diffused flames; combustion techniques: design principles and performance analysis, fuel emissions analysis: pollutants and their generation, Euro and BS norms and protocols, strategies for emission reduction	
Books (In case UG compulsory courses, please give it as “Text books” and “Reference books”. Otherwise give it as “References”.	
Text Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	S Sarkar, <i>Fuels and Combustion</i> , Third Edition, CRC Press, 2010.
2.	O P Gupta, <i>Elements of Fuel & Combustion Technology</i> , Khanna Publishers, 2018.
Reference Books: (Format: Authors, <i>Book Title in Italics font</i> , Volume/Series, Edition Number, Publisher, Year.)	
1.	S R Turns, <i>An Introduction to Combustion: Concepts and Applications</i> , Third Edition, McGraw Hill, 2011.
2.	H S Mukunda, <i>Understanding Combustion</i> , Second Edition, Universities Press, 2009.
3.	I Glassman, and R Yetter, <i>Combustion</i> , Fourth Edition, Academic Press, 2008.
4.	B K Sharma, <i>Fuels and Petroleum Processing</i> , First Edition, Goel publishing, 1998.