



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Science
Department of Chemistry
Generic Elective Courses
Choice Based Credit System (CBCS)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
GUCH105	UG	FUELS: Energy Resources of New Era	4	0	0	4	60	20	20	00	00

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit; Q/A – Quiz/Assignment/Attendance, MST Mid Sem Test.

*Teacher Assessment shall be based on the following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

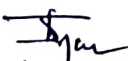
Course Objective:

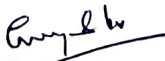
- To understand some basic concepts of Fuels.
- To identify & and analyze appropriate Chemical Analysis.
- To understand the application of chemistry in a more appropriate manner.

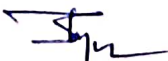
Course Outcomes: -

After completion of this course, the students are expected to be able to demonstrate the following knowledge, skills, and attitudes. The student will demonstrate the capability of

- will gain basic knowledge of fuels.
- be able to discuss the challenges faced in each step of Energy sources.
- Will be able to understand the Basics of safety and handling of Fuels.


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UNIT 1

Energy sources; classification of fuels; traditional and alternate fuels; properties of fuels, Combustion of fuels, Renewable and Non-renewable sources of energy.

UNIT 2

Gaseous fuels: Definitions and properties, Biogas, landfill gas, Hydrogen, LPG, Natural gas, CNG, coal-bed methane.

Liquid fuels: Definitions and properties, Biofuels, bioethanol, biodiesel, green diesel, methanol, and comparison with petroleum-derived fuels

UNIT 3

Solid fuels: Definitions and properties of solid fuels, Biomass, Plastic waste, Municipal solid waste.

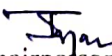
Bio-refineries; types and classification; examples; comparison with petroleum refineries


UNIT 4

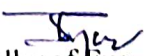
Coal classification and composition, Carbon capture and utilization/storage, Carbon credit, Solar Energy, Wind Energy, Hydropower and its applications.

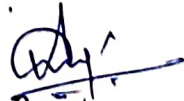
UNIT 5

Introduction to fuel cells, working and types of fuel cells, Fuel cells for automotive applications, Hydrogen economy, Methanol economy, and Cogeneration.


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List of Textbooks

- 1 Fundamentals of Petroleum Refining – Mohamed A. Fahim, Taher A. Alsahhaf and Amal Elkilani
- 2 Biomass for Renewable Energy, Fuels, and Chemicals – Donald L. Klass
- 3 Chemistry of Fossil Fuels and Biofuels – Harold H. Schobert
- 4 Fuels and Combustion – Sameer Sarkar - University Press
- 5 Alternative Fuels - S. S. Thipse – Jaico Publishing

List of Additional Reading Material / Reference Books

- 1 Biofuels Engineering Process Technology – C. M. Drapcho, N. P. Nhuan, T. H. Walker

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