



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Science

Department of Chemistry

Generic Elective (GE) Under Graduate Courses

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Lk	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
GUCH103	GE	FUELS: Energy Resources of New Era	60	20	20	00	00	3	0	0	3

Legend: 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 following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Objective:

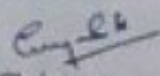
- To understand some basic concepts of Fuels.
- To identify & analyze appropriate Chemical Analysis.
- To understand application of chemistry in a more appropriate manner.

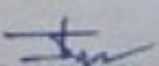
Course Outcomes: -

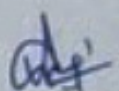
After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes. The student will demonstrate capability of

- will gain basic knowledge of fuels.
- be able to discuss the challenges faced in each step of Energy sources.
- Will be able to understand Basics of safety & 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: Biogas, landfill gas, hydrogen, LPG, natural gas, CNG, LNG, gas hydrates, coal-bed methane, and shale gas

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

UNIT 3

Solid fuels: Biomass, plastic waste, municipal solid waste, and comparison with coal

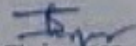
Bio-refineries; types and classification; examples; comparison with petroleum refineries


UNIT 4

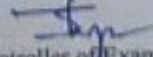
Carbon capture and utilization/storage; IGCC; Fisher-Tropsch synthesis; gas-to-liquids and coal-to-liquids etc., Carbon credit.

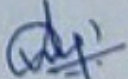
UNIT 5

Hydrogen economy; Methanol economy, Cogeneration; Fuels and fuel additives from renewable resources, Fuel cells.


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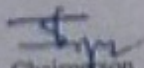
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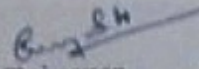
List of Textbooks

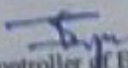
- 1 Fundamentals of Petroleum Refining – Mohamed A. Fahim, Taher A. Alsahhaf and Amal Eikilani
- 2 Biomass for Renewable Energy, Fuels, and Chemicals – Donald L. Klass
- 3 Chemistry of Fossil Fuels and Biofuels – Harold H. Schobert
- 4 Fuels and Combustion – Sameer Sarkar - University Press
- 5 Alternative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

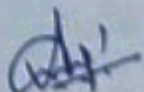
List of Additional Reading Material / Reference Books

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


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