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.

Chairperson Board of Studies Physical Sciences	Chairperson Faculty of Studies Science	Controller of Examinations SVVV, Indore	Registrar SVVV, Indore

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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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