

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (June - November 2026)

Department	: ECONOMICS & PHYSICS
Name/s of the Faculty	: Rekha M (EC) , Sr. Josephine Diana (PH) , Panimaya Peshija A (PH)
Course Title	: RENEWABLE ENERGY AND ENERGY ECONOMICS
Course Code	: 23ID/IC/RE55
Shift	: I

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	Identify the major types of energy resources, core principles of solar and wind energy, microeconomic factors, and major environmental energy policies.	K1
CO2	Explain the principles of renewable and non-renewable energy sources, their economic linkages, and policy frameworks.	K2
CO3	Apply scientific and economic methods to calculate energy consumption, harness energy from natural resources, evaluate energy systems, and assess demand–supply dynamics	K3
CO4	Analyse the production and performance of different solar and wind energy systems , energy markets, and assess energy market structure, goods and externalities.	K4
CO5	Evaluate the efficiency , limitations and working of solar, wind, and other renewable energy systems , role of renewable sources in reducing carbon footprint, global and national energy policies and assess their role in shaping sustainable energy policies.	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 15 – 22, 2026 (Day Order 1- 6)	I (PH)	Energy Resources 1.1 Energy routes for non-renewable energy resources – Age renewables and alternatives-Moving towards renewable energy sources - Energy conservation practices.	K1-K5	3	1-5	Blackboard tree building-energy journey mapping.	Reflection circle
	I (EC)	1.4 Evolution of energy economics – Energy Development	K1-K5	3	1-5	Lecture & Timeline and Concept Mapping	Assignment/ Quiz 1/ CA 1
Jun 23 – July 1, 2026 (Day Order 1- 6)	I(PH)	1.2 Types of energy sources - Renewable and non-renewable sources.	K1-K5	3	1-5	Flowchart, classification activity	Concept relay
	I(EC)	1.4 Evolution of energy economics - Energy –	K1-K5	3	1-5	Lecture, Data Visualization using	Data Interpretation Exercise,

		economy linkage – Energy transition.				India's energy, consumption & GDP trends, Documentary Analysis, Infographic Creation	Infographic assessment, Assignment/ Quiz 1/ CA 1
July 2 – July 8, 2026 (Day Order 1- 6)	I(PH)	1.3 Energy consumption - Energy calculation	K1-K5	3	1-5	Real Electricity Bill calculation, Demonstration.	One-Minute Energy Saving Challenge
	I(EC)	1.5 Current energy issues - Energy intensity – growth of renewable resources.	K1-K5	3	1-5	Calculation Exercise using country data & Renewable Energy Mapping Project	Worksheet, Numerical Assignment, CA 1
July 9 – 16, 2026 (Day Order 1- 6)	II(PH)	Solar Energy 2.1 Fundamentals of solar radiation – Nature of solar radiation – Radiation on earth's surface – Sun path chart.	K1-K5	3	1-5	Simulation, Lecture	Quiz
	IV(EC)	Micro Foundation 4.1 Demand - Energy demand - Primary and	K1-K5	3	1-5	Energy Consumption Data Analysis (IEA/BP Statistical Review) &	Data Analysis Report

		global				Case Study on EV Adoption or AI Energy Consumption	
July 17 – 24, 2026 (Day Order 1- 6)	II(PH)	2.1 Fundamentals of solar radiation – Nature of solar radiation – Radiation on earth’s surface – Sun path chart.	K1-K5	3	1-5	Simulation, Lecture	One-word reasoning
	IV(EC)	4.2 Supply- Factors affecting Energy supply	K1-K5	3	1-5	Scenario-Based Learning	Problem-Solving Worksheet, Quiz 1/ CA 1
July 25 – 28, 2026 (Day Order 1- 3)	II(PH)	2.2 Photovoltaics – Principles – Physics and operation of solar cells – Solar panels- Solar power plants – On and Off-grid photovoltaics application - Photovoltaics: country perspective	K1-K5	3	1-5	Field visit	Component test- MCQ- k1,k2 level- 20marks

	IV (EC)	4.2 Supply- Factors affecting Energy supply(Application)	K1-K5	1	1-5	Scenario-Based Learning	Problem-Solving Worksheet
July 29 – Aug 3, 2026	C.A. Test - I						
Aug 4 - 6, 2026 (Day Order 4 - 6)	IV (EC)	4.3 Market-equilibrium - Energy market structure	K1 – K5	2	1-5	Lecture, Discussion & Role Play (Consumers, Producers, Regulators)	Assignment/ Quiz 2/ CA 2
Aug 7 – 14, 2026 (Day Order 1- 6)	II (PH)	2.2 Photovoltaics – Principles – Physics and operation of solar cells – Solar panels- Solar power plants – On and Off-grid photovoltaics application - Photovoltaics: country perspective	K1-K5	3	1-5	Demonstration and discussion	One-min paper summary
	IV(EC)	4.3 Market equilibrium - Non-renewable (Oil) vs renewable energy	K1-K5	3	1-5	Lecture, Comparative Matrix Development	Assignment/ Quiz 2/ CA 2
Aug 17 - 24, 2026 (Day Order 1- 6)	II(PH)	2.2 Photovoltaics – Principles – Physics	K1-K5	3	1-5	Simulation, Lecture	Application pitch

	IV(EC)	and operation of solar cells – Solar panels- Solar power plants – On and Off-grid photovoltaics application - Photovoltaics: country perspective 4.4 Energy as a public good - Market failure - Externalities.	K1-K5	3	1-5	Lecture & discussion on: "Should Electricity be Free?"	Assignment/ Quiz 2/ CA 2
Aug 25 – Sep 2, 2026 (Day Order 1- 6)	III(PH)	Wind energy 3.1 Introduction – Basic principles of wind energy conversion.	K1-K5	3	1-5	Concept mapping	Quiz
	IV(EC)	4.4 Energy as a public good - Market failure - Externalities.	K1-K5	3	1-5	Carbon Footprint Calculation Exercise	Assignment/ Quiz 2/ CA 2
Sep 3 – 11, 2026 (Day Order 1- 6)	III(PH)	3.2 Nature of wind – Power in the wind - forces on the blades	K1-K5	3	1-5	Wind map discussion, Lecture	Exit ticket activity

	V(EC)	and wind energy conversion – Site selection. Energy and Environment 5.1 Mechanism to correct imperfection in energy market - Command and Control - Taxes and cap trade mechanism for internalization of environmental externalities.	K1-K5	3	1-5	Carbon Trading Simulation Game	Assignment/ Quiz 2/ CA 2
Sep 15-17, 2026 (Day Order 1 - 3)	III(PH)	3.2 Nature of wind – Power in the wind - forces on the blades and wind energy conversion – Site selection.	K1-K5	3	1-5	Field visit	Component test- Assignment- K3 level-5 marks
	V(EC)	5.1 Mechanism to correct imperfection in energy market - Command and Control - Taxes and cap trade	K1-K5	1	1-5	Carbon Trading Simulation Game	Assignment/ Quiz 2/ CA 2

		mechanism for internalization of environmental externalities.					
Sep 18 –23, 2026	C.A. Test - II						
Sep 24 - 28, 2026 (Day 4 – 6)	V(EC)	5.2 Energy and climate change - Energy security - Organizations - UNFCCC (Paris Agreement) , Bureau of Energy Efficiency (India), UNDP.	K1-K5	2	1-5	Carbon Trading Simulation Game, Climate Data Interpretation (NASA/IPCC Graphs) & Energy Security Index Construction Activity	Data Interpretation Test, Simulation Report, Assignment
Sep 29 – Oct 7, 2026 (Day Order 1 - 6)	III(PH)	3.3 Classification of wind energy conversion systems – Advantages and limitations.	K1-K5	3	1-5	Group discussion	Debate
	V(EC)	5.2 Energy and climate change - Energy security - Organizations - UNFCCC (Paris Agreement) , Bureau	K1-K5	3	1-5	Carbon Trading Simulation Game, Climate Data Interpretation (NASA/IPCC Graphs) &	Data Interpretation Test, Simulation Report, Assignment

		of Energy Efficiency (India), UNDP.				Energy Security Index Construction Activity	
Oct 8 - 14, 2026 (Day Order 1 - 6)	III(PH)	3.3 Classification of wind energy conversion systems – Advantages and limitations.	K1-K5	3	1-5	Video Lecture and Discussion	Score board activity
	V(EC)	5.3 Energy efficiency policies- Recent renewable energy policies in India	K1-K5	3	1-5	Policy Evaluation Workshop	Policy Evaluation Report & Energy audit report.
Oct 15 - 21, 2026 (Day Order 1- 4)	REVISION						

