



STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600 086

DEPARTMENT OF B. Voc. SUSTAINABLE ENERGY MANAGEMENT

Programme Specific Objectives:

1. Encourage Skill development and job readiness
2. Qualified in skill component and certified by NSDC at NSQF levels 4, 5, 6 & 7



3. The curriculum meets the needs of the industry and National Occupational Standards
4. Students qualify for a B.Voc. Degree from the University of Madras and also certification from Sector Skill Council
5. Hands on Training in the lab and in the industry
6. Acquire Industry-specific skills to enhance employability in the below qualification packs :
 - a) Solar PV Installer (Suryamitra) at Level 4
 - b) Rooftop Solar Grid Engineer Level 5
 - c) Biogas and Bio energy Technician at Level 6
 - d) Project Site Manager for Sustainable Energy at Level 7
7. Are equipped with occupational skills to enable entrepreneurial initiatives for accelerating India's economy through appropriate employment / entrepreneurship

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B.Voc. DEGREE : SUSTAINABLE ENERGY MANAGEMENT

COURSES OF STUDY

(Effective from the academic year 2016 - 2017)

CHOICE BASED CREDIT SYSTEM

Subject Code	Title of Course	Credits	Total Hours			Exam Hours	Marks		
			Lecture Hours (L)	Tutorial Hours (T)	Practical Hours (P)		Continuous Assessment	End Semester	Maximum
16TM/FC/TT14	Foundation Language - I Tharkkaala Tamil	4	4	0	0	3	25	75	100
16EL/FC/LS14	Foundation English - I Language and Study Skills	4	4	0	0	3	25	75	100
16VS/VM/FC16	Forms of Energy and Energy Crisis	6	3	0	3	6	25	75	100
16VS/VM/SE16	Solar Energy	6	3	0	3	6	25	75	100
16VS/VA/EE15	Energy Economics	5	5	0	0	3	25	75	100
16UV/ET/VP12	Values in Personal Life	2	2	0	0	-	25	-	100
16EA/GM/AB11	Extension Activity	1	-	-	-	-	-	-	-
Total		28							
Semester - II									
16TM/FC/AT24	Foundation Language - II Arra Nerri Tamil	4	4	0	0	3	25	75	100
16EL/FC/BS24	Foundation English - II - Business English & Secretarial Practice	4	4	0	0	3	25	75	100
16VS/VM/PV26	Fundamentals of Photovoltaics	6	3	0	3	6	25	75	100
16VS/VM/ET26	Energy Conversion Techniques	6	3	0	3	6	25	75	100
16VS/VE/EM25	Energy Management and Energy Audit	5	5	0	0	3	25	75	100
16VS/VE/WM25	Conservation of Water resources: Watershed Management								
16VS/UC/ES22	Environmental Studies	2	2	0	0	-	25	-	100
16VS/US/SS22	Soft Skills	2	2	0	0	-	25	-	100
16VS/US/CA22	Civic Awareness	2	2	0	0	-	25	-	100
Total		31							
Semester - III									
16TM/FC/KT34	Foundation Language - III Kappiya Tamil	4	4	0	0	3	25	75	100

16EL/FC/EA34	Foundation English - III - English for Advertising	4	4	0	0	3	25	75	100
16VS/VM/BE36	Bio Energy	6	3	0	3	6	25	75	100
16VS/VM/WM36	Waste Segregation and Management	6	3	0	3	6	25	75	100
16VS/VA/EN35	Environment and Ecology	5	5	0	0	3	25	75	100
16CS/UE/DP32	Electronic Documentation and Presentation	2	1	0	1	-	25	-	100
16PY/US/HB32	Human Behaviour	2	2	0	0	-	25	-	100
	Total	29							
Semester - IV									
16TM/FC/ST44	Foundation Language - IV Sanga Tamil	4	4	0	0	3	25	75	100
16EL/FC/FM44	Foundation English-IV-Front Office Management	4	4	0	0	3	25	75	100
16VS/VM/AB46	Advanced Bioenergy	6	3	0	3	6	25	75	100
16VS/VM/BB46	Biofuel Crops and Biofuels	6	3	0	3	6	25	75	100
16VS/VA/MF45	Microbial Fuel Cells	5	5	0	0	3	25	75	100
16CM/UE/BP42	Banking Practices	2	2	0	0	-	25	-	100
16UV/ET/CP42	Responsible Citizenship and Peace Initiatives	2	2	0	0	-	25	-	100
	Total	29							
Semester - V									
16VS/VM/NM56	Novel Materials for Sustainability	6	3	0	3	6	25	75	100
16VS/VM/ST56	Software Tools for Energy Analysis	6	3	0	3	6	25	75	100
16VS/VM/PD56	Solar Power Plant Designing	6	3	0	3	6	25	75	100
16VS/VM/PA56	Green Building and Passive Architecture	6	5	0	1	3	25	75	100
16VE/US/SF52	Value in Social and Family Life	2	2	0	0	-	25	-	100
16CS/US/IC44	Introduction to Computer Skills	4	2	0	2	-	25	-	100
	Total	30							
Semester - VI									
16VS/VM/EI66	Entrepreneurial Initiatives	6	4	0	2	3	25	75	100
16VS/VM/GM66	Green Management- Urban and Rural Scenario	6	5	0	1	3	25	75	100
16VS/VM/SC66	Energy for Smart Cities	6	5	0	1	3	25	75	100
16VS/VM/PR615	Project	15	0	0	1 5	-	25	75	100
	Total	33							

COURSE TITLE	FORMS OF ENERGY AND ENERGY CRISIS		
CODE	16VS/VM/FC16		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand the various forms of energy	1,4,5	R, U
2.	To get an insight of energy crisis and energy conservation practices	1,3,4,5	R, U, An, Ap

COURSE TITLE	SOLAR ENERGY		
CODE	16VS/VM/SE16		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand various concepts in utilization of Solar energy	1,3, 5,6a	U, Ap
2.	To learn the merits of solar energy for variety of applications	1,2,3, 5,6a	U, An, Ap

COURSE TITLE	ENERGY ECONOMICS		
CODE	16VS/VA/EE15		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To develop in the students an awareness of the basic issues and problems relating to the Energy Economics	1 to 6 1,3, 5,6a	U, An
2.	To help in critically analysing the energy market in the Indian context	1,2,5	R, U, Ap

COURSE TITLE	FUNDAMENTALS OF PHOTOVOLTAICS		
CODE	16VS/VM/PV26		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To learn about Photovoltaic technology principles	1,4,5,6b	U, Ap
2.	To get an insight about techniques and applications of solar cells	1,4,5,6b	U, Ap, E

COURSE TITLE	ENERGY CONVERSION TECHNIQUES		
CODE	16VS/VM/ET26		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To analyze the conventional	1,3,5	R, U, Ap

	energy conversion techniques		
2.	To develop understanding on direct energy conversion systems	1,3,5,6b	R, U, An, Ap, E
3	To appreciate the need and necessity of energy storage systems and their desirable characteristics	1,2,	U, An

COURSE TITLE	ENERGY MANAGEMENT AND ENERGY AUDIT		
CODE	16VS/VE/EM25		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand energy management.	1,2	U, Ap
2.	To get an insight of energy audit and energy conservation practices.	1,2	U, Ap, C

COURSE TITLE	CONSERVATION OF WATER RESOURCES: WATERSHED MANAGEMENT		
CODE	16VS/VE/CW25		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand different watershed behaviour	1,2,5	U, Ap
2.	To be able to interpret runoff data and quantify erosion by using various modelling methods	1,2,5	U, AP, AN
3.	To understand land use classification and impact of land use changes on hydrological cycle parameters	1,2,5,7	R, U, An

COURSE TITLE	BIO ENERGY		
CODE	16VS/VM/BE36		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To know the significance of Biomass energy	1,2,,5,6c,7	Ap, An, E
2.	To gain a fundamental knowledge of principles for the conversion of biomass to renewable energy	1,3,5,6c	U, An, Ap, E
3	To learn about bio gas plants and the future prospects of Biomass energy	1,3,4	U, Ap, E

COURSE TITLE	WASTE SEGREGATION AND MANAGEMENT		
CODE	16VS/VM/WM36		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To identify different types of waste, collect and segregate as per standard operating procedures	1,2,5	An, E, Ap
2.	To identify the different processes of waste management	1,2,4	R, U, Ap
3	To understand the need for maintaining health and safety at work place	1,3,5	U, Ap

COURSE TITLE	ENVIRONMENT AND ECOLOGY		
CODE	16VS/VA/EN35		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand the Global climatic change and the sustainable initiatives	1,3	R, U
2.	To know about the policies and Acts to control and prevent pollution	1,2	R, U
3.	To understand the role of environment in ecological context	1,3	U

COURSE TITLE	ADVANCED BIO ENERGY		
CODE	16VS/VM/AB46		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To gain knowledge on the different types of raw material that can be used for bioenergy generation	1,2, 6c	U, Ap
2.	To be able to plan, and install a biogas plant	1,2,5, 6c,7	Ap, E
3.	To be able to trouble shoot and maintain a biogas plant	1,3,6c ,7	U, An

COURSE TITLE	BIOFUEL CROPS AND BIOFUELS		
CODE	16VS/MC/BB46		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To learn to test gasifiers and the importance of biomass densification for gasification	1,4,5,6c	U, An, Ap

2.	To learn to produce biofuels by using oil extraction process.	1,4,5,6c	U, Ap, An, E, C
3	To carry out the biodiesel production, testing and utilization.	1,5, 6c	

COURSE TITLE		MICROBIAL FUEL CELLS	
CODE		16VS/VA/MF45	
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To gain fundamental knowledge in the development of microbial fuel cells.	1,3	R, U, An, Ap
2.	To understand hydrogen energy perspectives and hydrogen generation from renewable sources, storage and safety issues.	1,3	R, U, An, Ap, E
3	To understand the applications of microbial fuel cells	1,3	U, Ap

COURSE TITLE		NOVEL MATERIALS FOR SUSTAINABILITY	
CODE		16VS/VM/NM56	
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand the concept of sustainability	1,4	R, U
2.	To be able to apply different technologies for sustainability	1,4	R, U
3.	To gain knowledge on the role and impact of novel materials on technology for the sustainable development	1,4	U, Ap, An

COURSE TITLE		SOFTWARE TOOLS FOR ENERGY ANALYSIS	
CODE		16VS/VM /ST56	
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	<ul style="list-style-type: none"> To learn assessing the performance of energy systems through software. 	1,3,5	U, Ap, E
2.	<ul style="list-style-type: none"> To get familiarity to software tools available through demo sessions. 	1,2,3	U, Ap, E

COURSE TITLE		SOLAR POWER PLANT DESIGNING	
CODE		16VS/VM/PD56	

CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To be able to assess the solar power plant needs	1,2,7	U, An
2.	To gain knowledge on safety measures for working in a Solar power plant	1,2,7	R, U, An
3.	To gain Hands on Experience on designing of solar power plants	1,2,6c,7	Ap, An, E, C

COURSE TITLE	GREEN BUILDING AND PASSIVE ARCHITECTURE		
CODE	16VS/VM/PA56		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To increase the use of solar energy in buildings.	1,3,5	U, An, E
2.	To reduce the non-renewable energy demand and greenhouse gas emissions	1,3,,6d	Ap, E

COURSE TITLE	ENTREPRENEURIAL INITIATIVES		
CODE	16VS/VM/EI66		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To instil the spirit of entrepreneurship among youth and develop entrepreneurial initiatives	1,2,7	R, U
2.	To enhance self employment opportunities.	1,2,7	U, Ap
3.	To gain awareness on innovation and giving different dimensions to food products	1,2,7	Ap, An, E
	To train in the preparation of business project proposal		

COURSE TITLE	GREEN MANAGEMENT-URBAN AND RURAL SCENARIO		
CODE	16VS/VM/GM66		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To appreciate the concept of Green infrastructure	1,3,5	R, U, An, Ap
2.	To understand the needs of the urban and rural scenario for sustainable development	1,3,5	R, U, Ap, An

COURSE TITLE	ENERGY FOR SMART CITIES		
CODE	16VS/VM/SC66		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To understand the need for a smart city	1,2,4	U, An
2.	Purpose and design of the Smart Cities	1,2,4	U, C

COURSE TITLE	PROJECT		
CODE	16VS/MC/PR615		
CLO. NO	COURSE OBJECTIVES	PSLO'S Addressed	Cognitive Level
1.	To enable the student to work independently	1,4,5,7	Ap, E, C
2.	To apply the skill development training they have gained during the course of study to enhance employability	1,4,5,7	Ap, E, C
3.	To develop technical, interpersonal and communication skills and ability to generate new ideas in product development	1,4,5,7	Ap, E, C