Lecture plan for the courses handled related to Green Engineering Systems

	VIGNAN'S INSTITUTE OF ENGINEERING FOR WOMEN *Approved by AICTE, New Delhi, Affiliated to JNTU Kakinada* KapujaggarajuPeta, VSEZ(Post), Visakhapatnam-530049,AP

DEPARTMENT OF MECHANICAL ENGINEERING

LECTURE PLAN

Course Name: **Green Engineering Systems**	Course Code: **R163203D**
Year/ Sem : **III B TECH II SEM**	Regulation: **R16**

Lecture No.	Topic name	Source
Lecture 1	**UNIT I:** **SOLAR RADIATION:** Sun as source of energy, sun earth relationships	TB:2 Chapter 4 Pg. No: 83
Lecture 2	Extra-terrestrial and Terrestrial Radiations	TB:2 Chapter 4 Pg. No: 85
Lecture 3	Instruments for measuring Solar Radiation	TB:2 Chapter 4 Pg. No: 89
Lecture 4	Solar Radiation Data and numeric Problems	TB:2 Chapter 4 Pg. No: 91
Lecture 5	Problems on Solar Radiations	TB:2 Chapter 4 Pg. No: 91
Lecture 6	Problems on Solar Radiations	TB:2 Chapter 4 Pg. No: 91
Lecture 7	Solar radiation on titled surface	TB:2 Chapter 4 Pg. No: 109
Lecture 8	Types of PV cells	TB:2 Chapter 6 Pg. No: 186
Lecture 9	I-V characteristics	TB:2 Chapter 6 Pg. No: 186
Lecture 10	**SOLAR ENERGY COLLECTION:** Classification of Concentrating Collectors	TB:2 Chapter 5 Pg. No: 117
Lecture 11	Flat plate and concentrating collectors	TB:2 Chapter 5 Pg. No: 119
Lecture 12	Advanced collectors	TB:2 Chapter 5 Pg. No: 152
Lecture 13	**Unit-II:** **SOLAR ENERGY STORAGE:** Energy Storage Methods	T.B: 2 Chapter 3 Pg. No: 63
Lecture 14	Sensible and Latent Heat Storage	T.B: 2 Chapter 3 Pg. No:75
Lecture 15	Solar Dryer and Solar Distillation	T.B: 2 Chapter 5 Pg. No:145
Lecture 16	central power tower concept	T.B: 2 Chapter 5 Pg. No:153
Lecture 17	Solar Ponds	
Lecture 18	Solar Chimney Plant	T.B: 2 Chapter 5 Pg. No: 153
Lecture 19	**WIND ENERGY:** Sources and potential	T.B: 2 Chapter 7 Pg. No: 196
Lecture 20	Horizontal and Vertical Axis wind Mills	T.B: 2 Chapter 7 Pg. No: 218

PRINCIPAL
Vignan's Institute of
Engineering for Women
K.J.Peta, VSEZ (P.O.),
Visakhapatnam-49.

Lecture 21	Performance Characteristics	T.B: 2 Chapter 7 Pg. No: 218
Lecture 22	Betz Criteria	T.B: 2 Chapter 7 Pg. No: 211
Lecture 23	Types of Winds	T.B: 2 Chapter 7 Pg. No: 218
Lecture 24	Wind Data Measurement	T.B: 2 Chapter 7 Pg. No: 201
Lecture 25	**Unit-III:** **BIO-MASS:** Principles of bio mass conversion	T.B: 2 Chapter 8 Pg. No: 249
Lecture 26	Anaerobic digestion process	T.B: 2 Chapter 8 Pg. No: 263
Lecture 27	Types of Bio – Gas Digesters	T.B: 2 Chapter 8 Pg. No: 265
Lecture 28	Combustion Characteristics of Bio Gas	T.B: 2 Chapter 8 Pg. No: 268
Lecture 29	I.C. engine operation and economic aspects.	T.B: 2 Chapter 8 Pg. No: 272
Lecture 30	**GEOTHERMAL ENERGY:** Resources	T.B: 2 Chapter 9 Pg. No: 290
Lecture 31	Types of wells	T.B: 2 Chapter 9 Pg. No: 291
Lecture 32	Methods of Harnessing the energy	T.B: 2 Chapter 9 Pg. No: 292
Lecture 33	**OCEAN ENERGY:** Principles and utilization of OTEC plants	T.B:2 Chapter 10 Pg. No: 331
Lecture 34	Tidal Energy and Wave Energy	T.B:2 Chapter 10 Pg. No: 311
Lecture 35	Conversion Techniques	T.B:2 Chapter 10 Pg. No: 311
Lecture 36	Mini Hydel Power Plants and their economics	T.B:2 Chapter 10 Pg. No: 311
Lecture 37	**Unit-IV:** **ELECTRICAL SYSTEMS:** Energy efficient motors, energy efficient lighting and control	R.B:5 Chapter 10 Pg. No: 561
Lecture 38	Selection of Luminaire, variable voltage variable frequency drives	R.B:5 Chapter 10 Pg. No: 561
Lecture 39	Controls of HVAC	R.B:5 Chapter 10 Pg. No: 552
Lecture 40	Demand Site Management	R.B:5 Chapter 10 Pg. No: 551
Lecture 41	**MECHANICAL SYSTEMS:** Fuel cells working Principle	R.B:5 Chapter 10 Pg. No: 561
Lecture 42	Types of Fuel Cells	R.B:5 Chapter 10 Pg. No: 562
Lecture 43	Energy efficient compressors and pumps.	R.B:5 Chapter 16 Pg. No: 780
Lecture 44	Hydrological cycle – flow measurement –	T.B: 1 Chapter 6 Pg. No: 586
Lecture 45	**Unit-V:** **ENERGY EFFICIENT PROCESSES:** Environment friendly materials in manufacturing and its benefits	T.B: 3 Chapter 1 Pg. No: 1

Lecture 46	Benefits of Green Engineering Systems	T.B: 3 Chapter 1 Pg. No:10
Lecture 47	selection of recyclable and environment friendly materials in manufacturing	T.B: 3 Chapter 1 Pg. No: 16
Lecture 48	Environmental friendly machining like Vegetable based Cutting Fluids	T.B: 3 Chapter 2 Pg. No: 23
Lecture 49	Alternate Casting and joining Techniques	T.B: 3 Chapter 3 Pg. No: 49
Lecture 50	Zero Waste Manufacturing	T.B: 3 Chapter 4 Pg. No:73
Lecture 51	Environmental Aspects and Concerns	T.B: 3 Chapter 1,2 Pg. No:11,18,30
Lecture 52	**Unit-VI:** **GREEN BUILDINGS:** Sustainable site selection and planning of buildings	T.B: 3 Chapter 4 Pg. No: 73
Lecture 53	Definitions, Features and Benefits	T.B: 3 Chapter 4 Pg. No: 74
Lecture 54	Environmental Friendly Building materials like bamboo, timber, lime	T.B: 3 Chapter 4 Pg. No: 75
Lecture 55	Lime Pozzolona Cement, Agro Materials	T.B: 3 Chapter 4 Pg. No: 75
Lecture 56	Industrial wastes	T.B: 3 Chapter 4 Pg. No: 76
Lecture 57	Ferro cement and Ferro-concrete	T.B: 3 Chapter 4 Pg. No: 78
Lecture 58	Alternate roofing systems	T.B: 3 Chapter 4 Pg. No: 78
Lecture 59	Paints to reduce heat gain of the buildings	T.B: 3 Chapter 4 Pg. No: 79
Lecture 60	Energy management.	T.B: 3 Chapter 4 Pg. No: 80

TEXT BOOKS:

1. Sukhatme S.P. and J.K.Nayak, Solar Energy - Principles of Thermal Collection and Storage, TMH.

2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.

3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

REFERENCE BOOKS:

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra.

2. Principles of Solar Energy / Frank Krieth & John F Kreider.

3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.

4. Renewable Energy Technologies /Ramesh & Kumar /Narosa

5. Renewable Energy Technologies/ G.D Roy

D. Kesava
Course Coordinator

PRINCIPAL
Vignan's Institute of Engineering for Women
K.J.Peta, VSEZ (P.O.),
Visakhapatnam-49.

V. Ananda Babu
Head of the Department

	VIGNAN'S INSTITUTE OF ENGINEERING FOR WOMEN *Approved by AICTE, New Delhi, Affiliated to JNTU Kakinada* KapujaggarajuPeta, VSEZ(Post), Visakhapatnam-530049,AP

DEPARTMENT OF MECHANICAL ENGINEERING

LECTURE PLAN

Course Name: **Green Engineering Systems**	Course Code: **RT42032**
Year/ Sem : **IV B TECH II SEM**	Regulation: **R13**

Lecture No.	Topic name	Source
Lecture 1	**UNIT I:** **SOLAR RADIATION:** Sun as source of energy, sun earth relationships	TB:2 Chapter 4 Pg. No: 83
Lecture 2	Extra-terrestrial and Terrestrial Radiations	TB:2 Chapter 4 Pg. No: 85
Lecture 3	Instruments for measuring Solar Radiation	TB:2 Chapter 4 Pg. No: 89
Lecture 4	Solar Radiation Data and numeric Problems	TB:2 Chapter 4 Pg. No: 91
Lecture 5	Problems on Solar Radiations	TB:2 Chapter 4 Pg. No: 91
Lecture 6	Problems on Solar Radiations	TB:2 Chapter 4 Pg. No: 91
Lecture 7	Solar radiation on titled surface	TB:2 Chapter 4 Pg. No: 109
Lecture 8	Types of PV cells	TB:2 Chapter 6 Pg. No: 186
Lecture 9	I-V characteristics	TB:2 Chapter 6 Pg. No: 186
Lecture 10	**SOLAR ENERGY COLLECTION:** Classification of Concentrating Collectors	TB:2 Chapter 5 Pg. No: 117
Lecture 11	Flat plate and concentrating collectors	TB:2 Chapter 5 Pg. No: 119
Lecture 12	Advanced collectors	TB:2 Chapter 5 Pg. No: 152
Lecture 13	**Unit-II:** **SOLAR ENERGY STORAGE:** Energy Storage Methods	T.B: 2 Chapter 3 Pg. No: 63
Lecture 14	Sensible and Latent Heat Storage	T.B: 2 Chapter 3 Pg. No:75
Lecture 15	Solar Dryer and Solar Distillation	T.B: 2 Chapter 5 Pg. No:145
Lecture 16	central power tower concept	T.B: 2 Chapter 5 Pg. No:153
Lecture 17	Solar Ponds	
Lecture 18	Solar Chimney Plant	T.B: 2 Chapter 5 Pg. No: 153
Lecture 19	**WIND ENERGY:** Sources and potential	T.B: 2 Chapter 7 Pg. No: 196
Lecture 20	Horizontal and Vertical Axis wind Mills	T.B: 2 Chapter 7 Pg. No: 218

PRINCIPAL
Vignan's Institute of Engineering for Women
K.J.Peta, VSEZ (P.O.)
Visakhapatnam-530049

Lecture 21	Performance Characteristics	T.B: 2 Chapter 7 Pg. No: 218
Lecture 22	Betz Criteria	T.B: 2 Chapter 7 Pg. No: 211
Lecture 23	Types of Winds	T.B: 2 Chapter 7 Pg. No: 218
Lecture 24	Wind Data Measurement	T.B: 2 Chapter 7 Pg. No: 201
Lecture 25	**Unit-III:** **BIO-MASS:** Principles of bio mass conversion	T.B: 2 Chapter 8 Pg. No: 249
Lecture 26	Anaerobic digestion process	T.B: 2 Chapter 8 Pg. No: 263
Lecture 27	Types of Bio – Gas Digesters	T.B: 2 Chapter 8 Pg. No: 265
Lecture 28	Combustion Characteristics of Bio Gas	T.B: 2 Chapter 8 Pg. No: 268
Lecture 29	I.C. engine operation and economic aspects.	T.B: 2 Chapter 8 Pg. No: 272
Lecture 30	**GEOTHERMAL ENERGY:** Resources	T.B: 2 Chapter 9 Pg. No: 290
Lecture 31	Types of wells	T.B: 2 Chapter 9 Pg. No: 291
Lecture 32	Methods of Harnessing the energy	T.B: 2 Chapter 9 Pg. No: 292
Lecture 33	**OCEAN ENERGY:** Principles and utilization of OTEC plants	T.B:2 Chapter 10 Pg. No: 331
Lecture 34	Tidal Energy and Wave Energy	T.B:2 Chapter 10 Pg. No: 311
Lecture 35	Conversion Techniques	T.B:2 Chapter 10 Pg. No: 311
Lecture 36	Mini Hydel Power Plants and their economics	T.B:2 Chapter 10 Pg. No: 311
Lecture 37	**Unit-IV:** **ELECTRICAL SYSTEMS:** Energy efficient motors, energy efficient lighting and control	R.B:5 Chapter 10 Pg. No: 561
Lecture 38	Selection of Luminaire, variable voltage variable frequency drives	R.B:5 Chapter 10 Pg. No: 561
Lecture 39	Controls of HVAC	Internet
Lecture 40	Demand Site Management	Internet
Lecture 41	**MECHANICAL SYSTEMS:** Fuel cells working Principle	R.B:5 Chapter 10 Pg. No: 561
Lecture 42	Types of Fuel Cells	R.B:5 Chapter 10 Pg. No: 562
Lecture 43	Energy efficient compressors and pumps.	R.B:5 Chapter 16 Pg. No: 780
Lecture 44	Hydrological cycle – flow measurement –	T.B: 1 Chapter 6 Pg. No: 586
Lecture 45	**Unit-V:** **ENERGY EFFICIENT PROCESSES:** Environment friendly materials in manufacturing and its benefits	T.B: 3 Chapter 1 Pg. No: 1
Lecture 46	Benefits of Green Engineering Systems	T.B: 3 Chapter 1 Pg. No:10

Lecture 47	selection of recyclable and environment friendly materials in manufacturing	T.B: 3 Chapter 1 Pg. No: 16
Lecture 48	Environmental friendly machining like Vegetable based Cutting Fluids	T.B: 3 Chapter 2 Pg. No: 23
Lecture 49	Alternate Casting and joining Techniques	T.B: 3 Chapter 3 Pg. No: 49
Lecture 50	Zero Waste Manufacturing	T.B: 3 Chapter 4 Pg. No:73
Lecture 51	Environmental Aspects and Concerns	T.B: 3 Chapter 1,2 Pg. No:11,18,30
Lecture 52	**Unit-VI:** **GREEN BUILDINGS:** Sustainable site selection and planning of buildings	T.B: 3 Chapter 4 Pg. No: 73
Lecture 53	Definitions, Features and Benefits	T.B: 3 Chapter 4 Pg. No: 74
Lecture 54	Environmental Friendly Building materials like bamboo, timber, lime	T.B: 3 Chapter 4 Pg. No: 75
Lecture 55	Lime Pozzolona Cement, Agro Materials	T.B: 3 Chapter 4 Pg. No: 75
Lecture 56	Industrial wastes	T.B: 3 Chapter 4 Pg. No: 76
Lecture 57	Ferro cement and Ferro-concrete	T.B: 3 Chapter 4 Pg. No: 78
Lecture 58	Alternate roofing systems	T.B: 3 Chapter 4 Pg. No: 78
Lecture 59	Paints to reduce heat gain of the buildings	T.B: 3 Chapter 4 Pg. No: 79
Lecture 60	Energy management.	T.B: 3 Chapter 4 Pg. No: 80

TEXT BOOKS:

1. Sukhatme S.P. and J.K.Nayak, Solar Energy - Principles of Thermal Collection and Storage, TMH.

2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.

3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

REFERENCE BOOKS:

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra.

2. Principles of Solar Energy / Frank Krieth & John F Kreider.

3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.

4. Renewable Energy Technologies /Ramesh & Kumar /Narosa

5. Renewable Energy Technologies/ G.D Roy

PRINCIPAL
Vignan's Institute of Engineering for Women
K.J.Peta, VSEZ (P.O.),
Visakhapatnam-4

D. Kesava

Course Coordinator

Head of the Department