Course Schedule: June - November 2024 : B.Voc Sustainable Energy Management

Name/s of the Faculty : Dr.B.Keerthana

Course Title : Novel materials for sustainability

Course Code : 16VS/VM/NM56

Shift : II

Department

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Jun 19 – 26, 2024 (Day Order 1 - 6)	Unit 1.1: Introduction- Definition-Basic components of sustainable habitat- Sustainability of Fuel, electricity and water Unit 1.2: Root causes of Non-sustainability Existing Strategies- Resource utilization and impacts of a sustainable design on environment	Board and Chalk method Board and Chalk method	Purohit, S.S., Green technology – An approach for Sustainable environment, Jodhpur, Agrobios Publications, 2016 Purohit, S.S., Green technology – An approach for Sustainable environment, Jodhpur, Agrobios Publications, 2016	(3 rd component) Case Study Group discussion
Jun 27 – July 4, 2024 (Day Order 1 - 6)	Unit 1.3: Need for novel materials-Definition Evolutionary materials such as metals and metal oxides - Revolutionary materials such as Carbon Nanotubes, Dendrimers, Fullerenes and Combination materials such as composites - Materials with potential biological impact-Applications of novel materials	Board and Chalk method	Ni Bin Chang, Systems Analysis for sustainable Engineering: Theory and Applications, USA, McGraw-Hill Professional, 2011	Assignment

July 5 – 12, 2024 (Day Order 1 - 6)	Unit 2.1: Materials for sustainable fuel production: Materials for water splitting-catalysis and photocatalysis - Use of Titanium dioxide as	Board and Chalk method	Twidell, J.W. and Weir, A.D., Renewable Energy Resources, UK, Wiley, 2015	Quiz and group discussion
July 15 – 23, 2024 (Day Order 1 - 6)	Catalyst Unit 2.2: Newer Energy Materials for renewable energy storage and conversion: Polymers and composites for dye- sensitized solar cells and polymer solar cells- plastic solar cells- Perovskites -current status	Board and Chalk method	Twidell, J.W. and Weir, A.D., Renewable Energy Resources, UK, Wiley, 2015	Quiz and group discussion
July 24 – 31, 2024 (Day Order 1 - 6)	Unit 2.2: Novel electrode and electrolyte materials for batteries, Supercapacitors, Fuel cells and photovoltaics - Metal oxides framework	PowerPoint presentation	Allen D.T. and Shonnard, D.R. Sustainability Engineering: Concepts, Design and case Studies, USA, Prentice Hall, 2012	(3 rd component) Assignment
Aug 1 – 5, 2024 (Day Order 1 - 3)	Unit 2.3: Energy storage materials: Importance of hydrogen as fuel-Hydrogen storage-Zeolites	Board and Chalk method	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014	Group discussion
Aug 6 – 10, 2024	C.A. Test – I			
Aug 12 – 14, 2024 (Day Order 4-6)	Unit 3.1: Basic principle of thermoelectrics - Seebeck and Peltier effects	Board and Chalk method	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014	Practical and Demonstration

Aug 16 – 23, 2024 (Day Order 1-6)	Unit 3.2: Properties of thermoelectric materials-Thermoelectric materials for heating and cooling applications -Waste heat recovery	PowerPoint presentation	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014	Group discussion
Aug 27 – Sep 3, 2024 (Day Order 1-6)	Unit 3.3: Recent advances in the field of thermoelectricals	PowerPoint presentation	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014 Allen D.T. and	Group discussion
	Unit 4.1: Smart materials – Definition of Characteristics of smart materials	Board and Chalk method	Shonnard, D.R. Sustainability Engineering: Concepts, Design and case Studies, USA, Prentice Hall, 2012	Case study
Sep 4 – 11, 2024 (Day Order 1-6)	Unit 4.2: Energy saving materials - Energy efficient materials for lightings and screens Energy efficient material for LEDs- Organic LEDs and Polymer LEDs	PowerPoint presentation and Videos	Allen D.T. and Shonnard, D.R. Sustainability Engineering: Concepts, Design and case Studies, USA, Prentice Hall, 2012	Case study
Sep 12 - 20, 2024 (Day Order 1- 6)	Unit 4.3: Waste water treatment: Agricultural byproducts as sorbants for ammonia and organic substances- Zeolites-tuff and other natural materials	Board and Chalk method	Ni Bin Chang, Systems Analysis for sustainable Engineering: Theory and Applications, USA, McGraw-Hill Professional, 2011	(3 rd component) Micro projects

Sep 23 - 26, 2024 (Day Order 1-4)	Unit 5.1: Energy Saving Foundations: Structural Insulated Panels - Insulated Concrete Forms- Use of expanded polystyrene (EPS) and extruded polystyrene (XPS)-Plastic composite lumbar	PowerPoint presentation	Ni Bin Chang, Systems Analysis for sustainable Engineering: Theory and Applications, USA, McGraw-Hill Professional, 2011	Seminar
Sep 27 – Oct 3, 2024		C.A. Tes	t – II	
Oct 4 – 5, 2024 (Day 5 & 6)	Unit 5.2: Insulation materials Importance of insulation- R-Value of insulation materials-Functional uses of polyurethane- polyurethane health and safety	PowerPoint presentation	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014	Chart Making
Oct 7 - 15, 2024 (Day Order 1 to 6)	Unit 5.2: Plant based polyurethane foams from bamboo, hemp, kelp and straw bales- Foam Plastic Insulation Sheathing-Thermal Doors-Cool roofings —Vacuum insulation panels	Board and Chalk method	Bradley, A.S., Adebayo, A. O. Maria, P., Engineering applications in sustainable design and development, Canada, Cengage Learning, 2014	Chart Making
Oct 16 - 22, 2024 (Day Order 1 to 6)	Unit 5.3: Energy Efficiency and Conservation Roofings and membranes- Energy conserving windows Unit 5.3: Low e-windows- Earth walls-Energy efficient landscaping of gardens-Xeriscaping	PowerPoint presentation	Purohit, S.S., Green technology – An approach for Sustainable environment, Jodhpur, Agrobios Publications, 2016 Purohit, S.S., Green technology – An	Quiz and group discussion
	Sandana Tananahing	Board and Chalk	approach for	Quiz and group

	method	Sustainable environment, Jodhpur, Agrobios Publications, 2016	discussion
Oct 23 - 24, 2024			<u> </u>
(Day Order 1 to	REVISI	ION	
2)			

Course Schedule: June - November 2024 : B.Voc Sustainable Energy Management : Dr.B.Keerthana and Dr.R.Vincent Femilaa

Course Title : Software tools for Energy Analysis

Course Code : 16VS/VM/ST56

Shift : II

Department

Name/s of the Faculty

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Jun 19 – 26, 2024 (Day Order	Unit 1: Overview of effective tools for energy systems	Powerpoint presentation	http://www.trnsys.com/	Execution of Projects
1 - 6)	Unit2: Demonstration of the software to study the sizing	Demonstration through desktop using respective software tool		
Jun 27 – July 4, 2024 (Day Order 1 - 6)	Unit 1: Overview of effective tools for energy systems Unit2: Demonstration of the software to study the sizing	Powerpoint presentation Demonstration through desktop using respective software tool	http://www.trnsys.com/	Execution of Projects
July 5 – 12, 2024 (Day Order 1 - 6)	Unit 1:Analysis Of Software Parameters – PVSYST Unit 2: Simulation and data anlaysis of the PV systems.	Demonstration through desktop using respective software tool	http://www.pvsyst.com/en/software	Execution of Projects (3 rd Component)
July 15 – 23, 2024 (Day Order 1 - 6)	Unit 1:Analysis of Software Parameters – PVSYST Unit 2: Preliminary design	Demonstration through desktop using respective software tool	http://www.pvsyst.com/en/software	Execution of Projects

July 24 –	Unit 1:Analysis of	Demonstration		
31, 2024	Software Parameters	through		
(Day Order	-RETScreen	desktop using	http://www.retscreen.net/ang/home.php	Execution of
1 - 6)		respective		Projects
	Unit 2: Project Design	software tool		
Aug 1 – 5,	Unit 1:Analysis of			
2024	Software Parameters	Demonstration		Execution of
(Day Order	- RETScreen	through		Projects
1 - 3)		desktop using	http://www.retscreen.net/ang/home.php	(3 rd
	Unit 2: Economic	respective		Component)
	evaluation of the PV systems	software tool		
Aug 6 – 10,		•		
2024			C.A. Test – I	
Aug 12 –	Unit 1:Analysis of	Demonstration	http://www.trnsys.com/	Execution of
14, 2024	Software Parameters – eQUEST	through		Projects
(Day Order	040201	desktop using		(3 rd
4-6)		respective		`
	Unit 2: Analysis of Stand alone system.	software tool		Component)
Aug 16 –	Unit 3: Identification	Demonstration	http://www.trnsys.com/	Execution of
23, 2024	assessment and optimisation of the	through		Projects
(Day Order	technical viability of	desktop using		
1-6)	potential clean energy projects.	respective		
	chergy projects.	software tool		
	Unit 4: Evaluation of			
	Building Technologies			
Aug 27 –	Unit 3: Measurement	Demonstration	http://www.trnsys.com/	Execution of
Sep 3, 2024	and verification of	through		Projects
(Day Order	actual energy performance	desktop using		
1-6)	Unit 4: Analysis of	respective software tool		
ĺ	Building design			
Sep 4 – 11,	Unit 3: Evaluation of additional energy	Demonstration	http://www.trnsys.com/	Execution of

2024	savings/production	through		Projects
(Day Order	opportunities.	desktop using		
1-6)		respective		
		software tool		
	Unit 4: Study of			
	Energy Efficiency	Powerpoint		
	measures	presentation		
Sep 12 - 20,	Unit 5: Analysis of			
2024	solar array electrical	Demonstration		
(Day Order	behavior using	through		Execution of
1- 6)	software	desktop using	http://www.trnsys.com/	Projects
,		respective		(3 rd
	Unit 4: Study of	software tool		Component)
	Energy Efficiency measures			
Sep 23 - 26,	Unit 5: Simulation	Demonstration	http://www.trnsys.com/	Execution of
2024	of panel installation	through		Projects
(Day Order	in building using	desktop using		
1-4)	software	respective		
		software tool		
	Unit 4: Study of			
	Energy Efficiency measures			
Sep 27 –			C.A. Test – II	
Oct 3, 2024				
Oct 4-5,	Unit 5: Economic	Demonstration	http://www.trnsys.com/	Execution of
2024	evaluation – 'Return	through		Projects
(Day 5 &	on investment study'	desktop using		
6)		respective		
		software tool		
	Unit 4: Study of			
	Energy Efficiency			

	measures			
Oct 7 - 15, 2024 (Day Order 1 to 6)	Unit 4: Study of Energy Efficiency measures	Demonstration through desktop using respective software tool	http://www.trnsys.com/	Execution of Projects
Oct 16 - 22, 2024 (Day Order 1 to 6)	Revision of Units 1-5			
Oct 23 - 24, 2024 (Day Order 1 to 2)			REVISION	

Course Schedule: June - November 2024

Department : Sustainable Energy Management

Name/s of the Faculty : Dr. P. Anto Christy

Course Title : Solar Power Plant Designing

Course Code : 16VS/VM/PD56

Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Jun 19 – 26, 2024 (Day Order 1 - 6)	Unit 1 1.1. Basics of electricity and the structure of the electricity supply system- Alternating currents - AC Generator - AC Power	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	Question/Answer session
Jun 27 – July 4, 2024 (Day Order 1 - 6)	1.1 Three phase Ac generation and distribution 1.2. Electrical power system components: Substations and transformers – Overhead lines and underground cables – Faults, circuit breakers	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	Question/Answer session
July 5 – 12, 2024 (Day Order 1 - 6)	1.2 fuses and electrical protection 1.3. Study of site survey and soil test reports 1.4 Design and documentation: Plant Infrastructure - overall plant layout	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	Interactive Discussion on portions covered
July 15 – 23, 2024 (Day Order 1 - 6)	1.4 solar module mounting and other components - switchyard and power transmission system unit 2: 2.1 Design the capacity of solar power plant.	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private	Quiz

Aug 12 – 14, 2024	Unit 3: 3.1	PPT & lecture	Kapur A S.,	Mini project
(Day Order 4-6)	Design of combiner boxes, switchgear, batteries and Inverters 3.2. Energy simulation report for the design of combiner boxes		Practical Guide for Total Engineering of MW capacity Solar PV Power Project, Chandigarh, White Falcon Publishing, 2016	

2024		C.A. Test – I		
Aug 1 – 5, 2024 (Day Order 1 - 3) Aug 6 – 10,	2.2 Design and selection of solar modules 2.3. Selection of other components: Inverters, Strings, Combiner boxes, switchgear, batteries and Inverters	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	IIIrd Component Assignment
July 24 – 31, 2024 (Day Order 1 - 6)	1.4 solar module mounting and other components - switchyard and power transmission system unit 2: 2.1 Design the capacity of solar power plant.	PPT & lecture	Limited, 2015 Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	Quiz

Aug 16 – 23, 2024 (Day Order 1-6)	3.2 switchgear. 3.3. Energy simulation report for the design of batteries and Inverters	PPT & lecture	Kapur A S., Practical Guide for Total Engineering of MW capacity Solar PV Power Project, Chandigarh, White Falcon Publishing, 2016	Questioning on content taught
Aug 27 – Sep 3, 2024 (Day Order 1-6)	4.1. Establish and Follow safe work procedure - Use and maintain personal protective equipment	PPT & lecture	Kapur A S., Practical Guide for Total Engineering of MW capacity Solar PV Power Project, Chandigarh, White Falcon Publishing, 2016	IIIrd Component Assignment
Sep 4 – 11, 2024 (Day Order 1-6)	4.2 Identify and mitigate safety hazards - Demonstrate safe and proper use of required tools and equipment	PPT & lecture	Solanki C.S, Solar Photovoltaic Technology and Systems: A Manual for Technicians, Trainers and Engineers, Delhi, PHI Learning Private Limited, 2013	Quiz
Sep 12 - 20, 2024 (Day Order 1- 6)	4.3. Identify work safety procedures and instructions for working at height Unit 5: 5.1 5.1. Design plan for Earthing pits,	PPT & lecture	Solanki C.S, Solar Photovoltaic Technology and Systems: A Manual for Technicians, Trainers and Engineers, Delhi, PHI Learning Private Limited, 2013	Demonstration session
Sep 23 - 26, 2024 (Day Order 1-4)	5.1 lightning arrestor foundation, 5.2. Design of Street light foundation and	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private	IIIrd Component Assignment

	switchyard		Limited, 2015			
Sep 27 – Oct 3, 2024		C.A. Test – II				
Oct 4 – 5, 2024 (Day 5 & 6)	3.3. Energy simulation report for the design of batteries and Inverters	PPT & lecture	Kapur A S., Practical Guide for Total Engineering of MW capacity Solar PV Power Project, Chandigarh, White Falcon Publishing, 2016	Questioning on content taught		
Oct 7 - 15, 2024 (Day Order 1 to 6)	1.4 Design and documentation: Plant Infrastructure - overall plant layout	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	Interactive Discussion on portions covered		
Oct 16 - 22, 2024 (Day Order 1 to 6)	2.3. Selection of other components: Inverters, Strings, Combiner boxes, switchgear, batteries and Inverters	PPT & lecture	Solanki C.S, Solar Photovoltaics - Fundamentals, Technologies and Applications, Delhi, PHI Learning Private Limited, 2015	IIIrd Component Assignment		
Oct 23 - 24, 2024 (Day Order 1 to 2)	REVISION					

Course Schedule: June - November 2024

Department : Sustainable Energy Management

Name/s of the Faculty
Course Title
: Dr. R.Vincent Femilaa &Dr. P. Anto Christy
: Green Building and Passive Architecture

Course Code : 16VS/VM/PA56

Shift : II

Week & No. of hours	Units & Topics	Teaching	Text &	Method of
L 10 26 2024	TT	Methodology	References	Evaluation
Jun 19 – 26, 2024 (Day Order 1 - 6)	Unit 1 1.1 Concepts of energy efficient	PowerPoint presentation and Videos	Boecker J. "Integrative	Mind map preparation
	buildings.	videos	Design Guide to	
	Calculation of heating and		Green Building",	
	cooling loads of		UK, Wiley, 2009.	
	the building. Unit 3		Krieder. J and	
	3.1 Space Heating - Liquid and Air	Board and Chalk	Rabi, A. Heating	Group
	Systems - System	method	and Cooling of	discussion
	Design Principles		Buildings: Design	
	1		for Efficiency,	
			USA, McGraw-	
			Hill, 1994.	
Jun 27 – July 4, 2024	1.1 Building's energy balance	PowerPoint	Boecker J.	Micro projects
(Day Order 1 - 6)	energy balance accounting for	presentation and Videos	"Integrative Design Guide to	
	solar energy gain		Green Building",	
			UK, Wiley, 2009.	
	3.1 System design	Board and Chalk	Krieder. J and	Quiz
	Principles	method	Rabi, A. Heating	
			and Cooling of Buildings: Design	
			for Efficiency,	
			USA, McGraw- Hill, 1994.	
L-L- 5 12 2024	1 1 11-41	Danie Pai (,	0:-
July 5 – 12, 2024	1.1 Heat losses 1.2 Internal heat	PowerPoint presentation and	Boecker J. "Integrative	Quiz
(Day Order 1 - 6)	sources. Study of	Videos	Design Guide to	
	climate and its influence in		Green Building",	
	building design		UK, Wiley, 2009.	

for requiremen	energy nt		Krieder. J and Rabi, A. <i>Heating</i>	
3.1 t	thermal	Board and Chalk method	and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994.	Assignment

July 15 – 23, 2024	1.2 Low energy	Board and Chalk	Krieder. J and	Group
(Day Order 1 - 6)	and zero energy	method	Rabi, A. <i>Heating</i>	discussion
(Day Older 1 0)	buildings. Unit 22.1	method	and Cooling of	
	Thermal comfort		Buildings: Design	
	- Heat		for Efficiency, USA, McGraw-	
	transmission in buildings		Hill, 1994.	
	- Bioclimatic		Gevorkian P.	
	classification 3.1 Sizing of	D D :	"Alternative	Assignment
	Collectors and	PowerPoint	Energy Systems in	
	Thermal Storage	presentation	Building Design",	
			USA, McGraw-Hill, 201	
			11111, 201	
July 24 – 31, 2024			Krieder. J and	Case study
(Day Order 1 - 6)		Board and Chalk	Rabi, A. <i>Heating</i>	
	2.2 Passive	method	and Cooling of	
	heating concepts - Direct heat gain	method	Buildings: Design	
	- Solar Windows		for Efficiency, USA, McGraw-	
	- indirect heat		Hill, 1994.	
	gain		Gevorkian P.	
		PowerPoint	"Alternative	IIIrd Component
		presentation and Videos	Energy Systems in	Assignment
	3.2 Domestic Hot Water Heating	videos	Building Design",	
	water Heating		USA, McGraw-Hill, 201	
			HIII, 201	
Aug 1 – 5, 2024	2.2 Masonry and	Board and Chalk	Krieder. J and	
(Day Order 1 - 3)	Water Thermal	method	Rabi, A. <i>Heating</i>	
(Day Order 1 - 3)	Storage Wall	method		Quiz
			and Cooling of	
			Buildings: Design	
			for Efficiency,	
			USA, McGraw-	
			Hill, 1994.	
			Gevorkian P.	Group Discussion
	3.2 Domestic Hot Water Heating		"Alternative	Discussion
	Loads	PowerPoint presentation and	Energy Systems in	
		Videos	Building Design",	

			USA, McGi Hill, 2011	raw-
Aug 6 – 10, 2024			C.A. Test – I	
Aug 12 – 14, 2024 (Day Order 4-6)	Aug 12 – 14, 2024 (Day Order 4-6)	Unit 5 5.1 Green building features - Green materials 3.2 Sizing of System Components	Lecture& PPT PowerPoint presentation and Videos	Attmann O. "Green Architecture", USA, McGraw- Hill, 2010. Gevorkian P. "Alternative Energy Systems in Building Design", USA, McGraw- Hill, 2011
Aug 16 – 23, 2024 (Day Order 1-6)	Aug 16 – 23, 2024 (Day Order 1-6)	5.1 Window coating – Roof top coating – Protective coatings 3.2 System Installation Principles	Board and Chalk method Lecture and PPT	Attmann O. "Green Architecture", USA, McGraw- Hill, 2010. Gevorkian P. "Alternative Energy Systems in Building Design", USA, McGraw- Hill, 2011
Aug 27 – Sep 3, 2024 (Day Order 1-6)	Aug 27 – Sep 3, 2024 (Day Order 1-6)	5.1 integrated ecological design 4.1 Cooling Requirements	PowerPoint presentation and Videos	Attmann O. "Green Architecture", USA, McGraw- Hill, 2010. Gevorkian P. "Alternative Energy Systems in Building Design", USA, McGraw-

		Hill, 201
		, -

Sep 4 – 11, 2024	Sep 4 – 11, 2024	5.2 The National	Board and Chalk	Krieder. J and
(Day Order 1-6)	(Day Order 1-6)	green building rating system GRIHA	method	Rabi, A. Heating and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994.
		4.1 Cooling Load	PowerPoint	Gevorkian P.
		Calculations	presentation and Videos	"Alternative
			, 1330	Energy Systems in
				Building Design",
				USA, McGraw-
				Hill, 2011
Sep 12 - 20, 2024 (Day Order 1- 6)	Sep 12 - 20, 2024 (Day Order 1- 6)	5.2 indoor environment quality.	Lecture& PPT	Krieder. J and Rabi, A. Heating and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994.
				Gevorkian P.
				"Alternative
		4.1 Cooling Load	PowerPoint	Energy Systems in
		Calculations	presentation and Videos	Building Design",
		Curculations		USA, McGraw-
				Hill, 2011
Sep 23 - 26, 2024 (Day Order 1-4)	Sep 23 - 26, 2024 (Day Order 1-4)	5.2 IGBC rating systems	PowerPoint presentation and Videos	Gevorkian P. "Alternative Energy Systems in Building Design", USA, McGraw- Hill, 2011
		4.2		Krieder. J and
		Absorption	Chalk and talk	Rabi, A. Heating
		Refrigeration		and Cooling of
				Buildings: Design
				for Efficiency,
				USA, McGraw-
				Hill, 1994.

Sep 27 – Oct 3, 2024	C.A. Test – II				
Oct 4 – 5, 2024 (Day 5 & 6)	5.2 IGBC rating systems	PowerPoint presentation and Videos	Gevorkian P. "Alternative Energy Systems in Building Design", USA, McGraw- Hill, 2011	Survey report	
	4.2 Heat Pumps	Chalk and talk	Krieder. J and Rabi, A. Heating and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994.	Role play	
Oct 7 - 15, 2024 (Day Order 1 to 6)	5.1 integrated ecological design 4.2 Absorption Refrigeration - Heat Pumps	Board and Chalk method PPT and lecture	Attmann O. "Green Architecture", USA, McGraw- Hill, 2010. Krieder. J and Rabi, A. Heating and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994.	Debate Group Discussions	
Oct 16 - 22, 2024 (Day Order 1 to 6)	2.2 Passive heating concepts 3.2 Domestic Hot Water Heating Loads	Lecture& PPT Chalk and talk	Krieder. J and Rabi, A. Heating and Cooling of Buildings: Design for Efficiency, USA, McGraw- Hill, 1994. Attmann O. "Green Architecture", USA, McGraw- Hill, 2010.	Quiz Interactive session	

Oct 23 - 24, 2024		DEX	ICION	
(Day Order 1 to 2)	REVISION			