B. Sc (Information Technology)		Semester – II	
Course Name: Environmental Study for Sustainable IT II		**Course Code: VGVUVE206**	
Periods per week (1 Period is 60 minutes)		**2**	
Credits		**2**	
		Hours	**Marks**
Evaluation System	**Theory Examination**	**2**	**60**
	Internal		**40**

Course Objective
To aid learner to
1. Understand issues of Green Computing as well as different standards.
2. Understand the modern approaches to Green Computing.
3. Understand the alternatives for cooling your data center.
4. Understand the need for making computer networks and communications energy efficient
5. Understand cloud computing in the context of environmental sustainability and various elements of clouds that contribute to total energy consumption

Unit	Details	Lectures
I	**Overview and Issues:** Problems: Toxins, Power Consumption, Equipment Disposal, Company's Carbon Footprint: Measuring, Details, reasons to bother, Plan for the Future, Cost Savings: Hardware, Power. **Initiatives and Standards:** Global Initiatives: United Nations, Basel Action Network, Basel Convention, North America: The United States, Canada, Australia, Europe, WEEE Directive, RoHS, National Adoption, Asia: Japan, China, Korea.	10
II	**Minimizing Power Usage:** Power Problems, Monitoring Power Usage, Servers, Low-Cost Options, Reducing Power Use, Data De-Duplication, Virtualization, Management, Bigger Drives, Involving the Utility Company, Low-Power Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, Software.	10

	Cooling: Cooling Costs, Power Cost, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, HP's Solution, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Cable Management, Vapour Seal, Prevent Recirculation of Equipment Exhaust, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling, Fluid Considerations, System Design, Datacentre Design, Centralized Control, Design for Your Needs**.**	
III	**Green Networks and Communications :** Introduction, Objectives of Green Network Protocols, Green Network Protocols and Standards. **Green Cloud Computing and Environmental Sustainability :** Introduction, What is Cloud Computing?, Cloud Computing and Energy Usage Model: A Typical Example, Features of Clouds Enabling Green Computing, Green Cloud Architecture	10

Course Outcome
Learners should be able to
CO1 Give an account of the concept green IT, environmental perspectives on IT use, standards and certifications related to sustainable IT products.
CO2 Describe green IT in relation to technology.
CO3 Evaluate IT use in relation to environmental perspectives.
CO4 Formulate plans for reducing IT heating and cooling requirements.
CO5 Implement Green IT in Real Life.

Books and References:

Sr. No.	Title	Author/s	Publisher	Edit ion	Year
1.	Green IT	Toby Velte, Anthony Velte, & Robert Elsenpete	McGraw Hill		2008
2.	Harnessing Green It Principles And Practices	San Murugesan, G.R. Gangadharan	WILEY		-
3.	Green Data Center: Steps for the Journey	Alvin Galea, Michael Schaefer, Mike Ebbers	Shroff Publishers And Distributors		2011
4.	Green Computing and Green IT Best Practice	Jason Harris	Emereo		
5.	Green Computing Tools and Techniques for Saving Energy, Money and Resources	Bud E. Smith	CRC Press		2014