DEPARTMENT OF ARCHITECTURE

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	**BUILDING ENERGY AUDIT & MANAGEMENT**		
Course Code	**AR 702**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	-		
Session	**January 2018**	**Section**	**S**
Name of Faculty	**D.Kannamma**	**Department**	**Architecture**
Email	**kanama@nitt.edu**	**Telephone No.**	**9487521927**
Course Type	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

An overview of energy consumption and its effects. Current energy consumption scenario in India. Need to reduce emissions. Aims and main aspects of energy management of buildings. Benefits and methodology for conducting the Historical Energy audit. Objectives & benefits and conducting Diagnostic Energy Audit. Instrumentation.

Energy management matrix as a tool to diagnose the current state of energy management in any given organization. Management issues covered in the matrix – energy policy, organization, motivation, information systems, Marketing & investment. Determining the organizational profile. Monitoring & Targeting of energy use.

Identification of opportunities for reducing energy consumption – improvements to the building fabric & building services.

Details of building energy survey – building information, building physical data, building envelope construction details, mechanical systems, electrical systems & equipment, hot water systems, indoor environmental conditions for each space, control systems and operating schedules.

Energy use profile, maintenance schedule, and special energy conservation features observed. Energy conservation program. Comment & suggestions to improve energy savings. Tables of: energy costs-comparative analysis; energy usage in MJ-comparative analysis and summary sheet – total energy cost & consumption.

COURSE OBJECTIVES

The primary objective of Energy Audit course is to understand methods and techniques involved to reduce energy consumption per unit of product output or to lower operating costs. The course provides a "bench-mark" for managing energy in building and building group. The subject provides the basis for planning a more effective use of energy throughout building design.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Students will have knowledge of Basics of Energy its various forms and conservation techniques.	
2. Students will be able to apply their knowledge for Evaluation of thermal performance and Energy Management & Audit.	
3. Students will be able contribute towards Energy Monitoring and Targeting, Heat Recovery and Cogeneration.	

COURSE PLAN – PART II

COURSE OVERVIEW

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programs which are vital for production and utility activities. Such an audit program will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc. In general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	**2 Weeks**	An overview of energy consumption and its effects. Current energy consumption scenario in India. Need to reduce emissions. Aims and main aspects of energy management of buildings.	**Lecture**
2	**1 Week**	Benefits and methodology for conducting the Historical Energy audit. Objectives & benefits and conducting Diagnostic Energy Audit and Instrumentation	**Lecture**
2	**2 Weeks**	Energy management matrix as a tool to diagnose the current state of energy management in any given organization. Management issues covered in the matrix – energy policy, organization, motivation, information systems, Marketing & investment.	**Lecture**
3	**2 Weeks**	Determining the organizational profile. Monitoring & Targeting of energy use. Identification of opportunities for reducing energy consumption – improvements to the building fabric & building services	**Lecture**
4	**3 Weeks**	Details of building energy survey – building information, building physical data, building envelope construction details, mechanical systems, electrical systems & equipment, hot water systems, indoor environmental conditions for each space, control systems and operating schedules	**Lecture**
5	**2 Weeks**	Energy use profile, maintenance schedule, and special energy conservation features observed. Energy conservation program. Comment & suggestions to improve energy savings.	**Lecture**
6	**2 Weeks**	Tables of: energy costs-comparative analysis; energy usage in MJ-comparative analysis and summary sheet – total energy cost & consumption.	**Lecture**

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	After 5 weeks of joining the course	1 Hour	10 %
2	Assignment 1	After 3 weeks of joining the course	2 weeks	15%
3	Test 2	After 10 weeks of joining the course	1 Hour	10 %
4	Assignment 2	After 8 weeks of joining the course	1 Week	15%
CPA	Compensation Assessment	Period between 16.04.2018 to 19.04.2018		
5	Final Assessment	Period between 23.04.2018 to 04.05.2018	2 Hours	50%

COURSE EXIT SURVEY

Feedback from the students through questionnaire before End Semester Examination

COURSE POLICY

1. Students to have a minimum of 75% attendance to appear in final examination.
2. Plagiarism or any kind of academic dishonesty will not be entertained.
3. Students are to follow the given schedule for each project and submissions are to be made on time.
4. Submission dates are normally decided in consultation with students. Late submissions unless for valid, genuine reasons will get reduced marks.
5. Students with shortage of attendance will be required to submit assignments / projects to compensate for attendance loss.
6. Retest will conducted for the students during the compensation period.
7. A minimum of 30 % should be scored in the final assessment for a pass.
8. The minimum marks for E grade is fixed as 40 marks (40 % of total marks, continuous assessment and final assessment marks put together).

MODE OF CORRESPONDENCE (email/ phone etc)

The Course Coordinator is available for consultation at times that are displayed on the coordinator's office notice board. Queries may also be emailed to the Course Coordinator directly at **kanama@nitt.edu**

FOR APPROVAL

16/01/2018

Course Faculty _____ (Dr. D. Kanyamma) **CC-Chairperson** _____ **HOD** _____ 16/1/18