NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN			
Course Title	ENERGY AND ENVIRONMENTAL ENGINEERING		
Course Code	ENIR 11	No. of Credits	02
Department	*EEE-A Section*	Faculty	Ms.S.kalaivani
Pre-requisites Course Code	None		
Course Coordinator(s) (if, applicable)	Dr.M.Premalatha		
Other Course Teacher(s)/Tutor(s) E-mail	skalai@nitt.edu	Telephone No.	9486057213
Course Type	Core course		

COURSE OVERVIEW

Students get exposure to the Energy resources in India and Different type of conventional Power Plants. Students will be taught about the Basics of Solar Energy, Solar Thermal Energy, and Solar Photovoltaic with applications. Students will understand the operation of wind turbines to get Power and energy from and to study off shore Wind energy with Environmental benefits and impacts. Students have an opportunity to study Air pollution, Water pollution, Noise pollution & disposal of solid waste. Further they will be exposed to Greenhouse gases, acid rain & Fossil fuels and impacts, Industrial and transport emissions-impacts.

COURSE OBJECTIVES

1. To teach the principal renewable energy systems like Solar, Wind, Thermal, etc.
2. To explore the environmental impact of various energy sources and also the effects of different types of pollutants & types of Pollution.
3. To learn the importance of environment by assessing its impact on the human world; Study of Power Plants, Biomass conversion Technologies & Geothermal Energy resources.
4. To learn the energy scenario and the environmental issues related to the power plants.
5. To study the integrated themes and biodiversity, natural resources, pollution control and Greenhouse gases with Industrial and transport emissions Impacts.

COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
1. Deliver the fundamental principles and Techniques of renewable energy systems like Solar, Wind, Thermal, Geothermal Energy, and Ocean Thermal Energy & Tidal.	1)The students can understand the types renewable energy systems like Solar, Wind, Thermal ,Tidal, etc.
2. Describes the Biomass resources, Biomass conversion Technologies, Feedstock pre-processing & Bioenergy Program in India.	2) The students will be able to understand Biomass conversion and Bioenergy Program in India.
3. Brief understanding of India's wind energy potential and Power and energy from wind turbines with types.	3) This course introduce students to the energy scenario and the environmental issues related to the power plants & Conventional vs Non-Conventional power generation.
4. Study about the Air pollution, Water pollution, Soil pollution & Noise pollution and Environmental Impacts of Industrial emissions & Greenhouse gases.	4) The Students can explore the environmental impact of various Energy sources.
5. Describes the Present Energy resources in India &Conventional vs Non-conventional power generation Learning and observation.	5) The Students can understand Green House Gases, Pollution & effects of different types of Pollutants.

COURSE TEACHING AND LEARNING ACTIVITIES

S.no	Week	Topic	Mode of delivery
1.	1-2	Present Energy resources in India and its sustainability Different type of conventional Power Plant	Lecture C&T/ PPT or any suitable mode
2.	3-6	Solar Thermal Energy, Solar Photovoltaic- Advantages and Disadvantages.	
3.	7-10	Types of wind turbines, Off shore Wind energy, Environ-mental benefits and impacts.	
4.	11-14	Biomass resources Biomass conversion Technologies-Feedstock pre-processing and treatment methods. Ocean Thermal Energy Conversion, Tidal Energy	
5.	15-16	Air pollution act, Air pollution measurement, Water pollution-Sources and impacts.	
6.	17	LAB Visit	Demo

COURSE ASSESSMENT METHODS

S.no	Mode of Assessment	Week/ Date	Duration	% Weightage
1.	Assessment – 1 (Descriptive Type)	6th Week	60 Minutes	20%
2.	Assessment – 2 (Conceptual and Logical Test)	11th Week	60 Minutes	20%
3.	Assessment – 3 (Group Task) Mini Project	13th Week	--------	25%
4.	Compensation Assessment (CPA)	Before End Semester	60 Minutes	Corresponding Weightage
5.	Assessment – 4 (Descriptive)	End Semester	90 Minutes	35%

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

Text Books:

1. *Boyle, G. 2004.' Renewable energy: Power for a sustainable future'. Oxford University*
2. *B H Khan, 'Non Conventional Energy Resources'-The McGraw –Hill Second edition.*
3. *G. D. Rai, 'Non conventional energy sources', Khanna Publishers, New Delhi, 2006.*
4. *Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd Edition, Prentice Hall, 2003.*

Reference Books:

1. *'Unleashing the Potential of Renewable Energy in India' –World bank report.*
2. *Godfrey Boyle, Bob Everett and Janet Ramage.2010.'Energy Systems and Sustainability.*

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

- Feedback from the students during class committee meetings.
- Anonymous feedback through questionnaire and unknown formats.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

CORRESPONDENCE

All the students are advised to come to the class regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/any other information regarding this course) will be intimated in the Class only.

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum of 75 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.
2. Any student, who fails to maintain 75% attendance need to appear for the compensation assessment (CPA). Student who scores more than 60 % marks in the CPA along with assessment criteria will be eligible for attending the end semester examination.
3. Those students who have attendance lag and also missed any of the continuous assessments (CAs) can appear for CPA to get eligibility for writing the end semester examination as quoted in Pt. 2. Their scores in the CPA WILL NOT be taken into account for computing marks for CA.
4. Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to RE DO the course.

ASSESSMENT

5. Attending all the assessments are MANDATORY for every student.
6. If any student is not able to attend any of the Assessments due to genuine reason, student is permitted to attend the Repeat assessment (RA) with Corresponding weightage.
7. Student who fails to score 60% in RA will take up additional assignments to get eligibility for writing End Semester examination.

Finally, every student is expected to score minimum 1/3rd of the top rank holder of the class (Including all the assessments) to pass the course. Otherwise the student would be declared fail and 'F' grade will be awarded. Further he can take up only FORMATIVE ASSESSMENT.

8. Please refer B.Tech Regulations 2015(B.12.1) for the letter grades and the corresponding grades

ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered as dishonest.
2. Tendering of information such as giving one's program, assignments to another student to use or copy is also considered as dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

ADDITIONAL COURSE INFORMATION

1. The faculty is available for consultation at times as per the intimation given by the faculty.
2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher(skalai@nitt.edu)

FOR SENATE'S CONSIDERATION

Course Faculty _____ CC-Chairperson _____ HOD _____

Course Co-ordinator _____