

DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech Mechanical Engineering		
Course Title	Energy and Environmental Engineering		
Course Code	ENIR 11	No. of Credits	2
Course Code of Pre-requisite subject(s)	Physics		
Session	Jan. 2019	Section	--
Name of Faculty	Mr.R.SUSHILRAJ	Department	Mechanical
Email	sushil@nitt.edu	Telephone No.	9952127229
Name of Course Coordinator(s) (if, applicable)			
Course Type	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
Syllabus (approved in BoS)			
<p>Present Energy resources in India and its sustainability - Different type of conventional Power Plant--Energy Demand Scenario in India-Advantage and Disadvantage of conventional Power Plants – Conventional vs Non-conventional power generation</p> <p>Basics of Solar Energy- Solar Thermal Energy- Solar Photovoltaic- Advantages and Disadvantages-Environmental impacts and safety.</p> <p>Power and energy from wind turbines- India's wind energy potential- Types of wind turbines- Off shore Wind energy- Environmental benefits and impacts.</p> <p>Biomass resources-Biomass conversion Technologies- Feedstock preprocessing and treatment methods- Bioenergy program in India-Environmental benefits and impacts. Geothermal Energy resources –Ocean Thermal Energy Conversion – Tidal.</p> <p>Air pollution- Sources, effects, control, air quality standards, air pollution act, air pollution measurement. Water pollution-Sources and impacts, Soil pollution-Sources and impacts, disposal of solid waste.</p> <p>Greenhouse gases – effect, acid rain. Noise pollution. Pollution aspects of various power plants. Fossil fuels and impacts, Industrial and transport emissions- impacts.</p>			

COURSE OBJECTIVES	
<ul style="list-style-type: none"> To teach the principal renewable energy systems. To explore the environmental impact of various energy sources and also the effects of different types of pollutants. 	
COURSE OUTCOMES (CO)	
Course Outcomes	Aligned Programme Outcomes (PO)
Apply advanced level knowledge, techniques, skills and modern tools in the field of Energy and Environmental Engineering.	1,4,8,9
Distinguish the different energy generation systems and their environmental impacts.	2,4,5,6
Identify major factors that would affect the atmosphere and the climate change.	10,11,12

COURSE PLAN – PART II			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 st week	Present Energy resources in India and its sustainability	Lecture C& T
2	2 nd week	Different type of conventional Power Plant	Lecture C& T
3	3 rd week	Energy Demand Scenario in India-Advantage and Disadvantage of conventional Power Plants	Lecture C& T
4	4 th week	Conventional vs Non-conventional power generation	Lecture C& T
5	5 th week	Basics of Solar Energy- Solar Thermal Energy	Lecture C& T
6	6 th week	Solar Photovoltaic- Advantages and Disadvantages	Lecture C& T
7	7 th week	Environmental impacts and safety Power and energy from wind turbines	Lecture C& T
8	8 th week	India's wind energy potential Types of wind turbines Off shore Wind energy- Environmental benefits and impacts.	Lecture C& T
9	9 th week	Biomass resources-Biomass conversion Technologies Feedstock preprocessing and treatment methods	Lecture C& T
10	10 th week	Bioenergy program in India-Environmental benefits and impacts. Geothermal Energy resources	Lecture C& T
11	11 th week	Ocean Thermal Energy Conversion – Tidal.	Lecture C& T

		Air pollution- Sources, effects, control, air quality standards, air pollution act, air pollution measurement	
12	12 th week	Water pollution-Sources and impacts, Soil pollution-Sources and impacts, disposal of solid waste. Greenhouse gases – effect, acid rain	Lecture C& T
13	13 th week	Noise pollution. Pollution aspects of various power plants. Fossil fuels and impacts,	Lecture C& T
14	14 th week	Industrial and transport emissions- impacts	Lecture C& T

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Cycle Test - 1	February 2 nd week	60 Minutes	20
2.	Cycle Test – 2	March 3 rd week	60 Minutes	20
3.	Assignment	Once in three weeks	-----	10
CPA	Compensation Assessment*	April 3 rd week	60 Minutes	20
4	Final Assessment *	April 4 th week	180 Minutes	50

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Feedback from the students during class committee meeting.
2. End semester feedback on Course Outcomes.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Phone/E-mail

COMPENSATION ASSESSMENT POLICY

If any student is not able to attend any of the cycle test (CTs: 1 -2) due to genuine reason, student is permitted to attend the compensation assessment (CPA) with % weightage equal to maximum of the CTs. However, the maximum of % weightage among the assessments for which the student

was absent will be considered for computing marks for CT. (This is not valid for students who have attendance lag.)

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION

Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher (sushil@nitt.edu)

FOR APPROVAL

Course Faculty R. Sushil CC-Chairperson S. Kesava HOD [Signature]
29/11/19