NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ENERGY AND ENVIRONMENT

COURSE PLAN – PART I			
Name of the programme and specialization	**M. TECH – ENERGY ENGINEERING**		
Course Title	**FOUNDATION FOR ENERGY ENGINEERING**		
Course Code	**EN601**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	-		
Session	**SEPTEMBER 2021**	**Section (if, applicable)**	-
Name of Faculty	**Dr. Godwin Glivin** **Dr. KARTHIK D**	**Department**	**ENERGY AND ENVIRONMENT**
Official Email	godwin@nitt.edu dkarthik@nitt.edu	**Telepho ne No.**	**+91 8848190490** **+91 8148373115**
Name of Course Coordinator(s) (if, applicable)	**NA**		
Official E-mail	-	**TelephoneNo.**	-
Course Type (please tick appropriately)	☑ **Core course** ☐ **Elective course** ☐ **GIR**		

Syllabus (approved in BoS)

- Thermodynamics: first law and its application, second law and its application, Irreversibility and energy, basic power generation cycles.
- Fluid Mechanics: stress-strain relations and viscosity, mass and momentum balance, flow through pipe.
- Heat Transfer: conduction, radiation, convective heat transfer.
- Network analysis: simple network analysis, power factor improvement.
- Electrical Machines: Transformer, Induction motor and generators, Synchronous generators, Introduction to modern speed control techniques, DC machines. Power systems: Introduction to power transmission and distribution.

COURSE OBJECTIVES

- To outline the thermodynamics law and application
- To provide the concepts of power generation cycle
- To impart the basics of fluid mechanics
- To familiarize with different types of electrical machines
- To give awareness about power transmission and distribution

MAPPING OF COs with POs

CourseOutcomes	Programme Outcomes (PO) (Enter Numbers only)
Upon completion of EN601, students should be able to	
1. To apply the thermodynamic principles in energy engineering	1, 2, 4, 6, 8 and 9
2. To compare the different power generation cycles	
3. To analyze and solve electric network problems	
4. To evaluate the performance/efficiency of electrical machines	
5. To interrelate the heat transfer process with fluid mechanics	

COURSE OVERVIEW

The course aims to educate the students about the fundamental science behind the concepts of energy and its kinds, governing principles, required basic concepts from necessary fields and finally educate to apply them in problem of energy engineering.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1 to 4	Electrical Machines: Transformer, Induction motor and generators, Synchronous generators, Introduction to modern speed control techniques, DC machines. Power systems: Introduction to power transmission and distribution.	MS Team, ppt
2	Week 5 to 8	Thermodynamics: first law and its application, second law and its application, Irreversibility and energy, basic power generation cycles.	MS Team, ppt
3	Week 8	Cycle Test - 1	Examination
4	Week 8 to 10	Fluid Mechanics: stress-strain relations and viscosity, mass and momentum balance, flow through pipe.	MS Team, ppt
5	Week 10 to 11	Network analysis: simple network analysis, power factor improvement	MS Team, ppt
6	Week 11	Cycle Test - 2	Examination
7	Week 12 to 13	Heat Transfer: conduction, radiation, convective heat transfer.	MS Team, ppt

8	Week 14 to17	End semester examination	Examination

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assignment	week 5	10 minutes	10
2	Class test 1*	week 8	60 minutes	25
3	Assignment	End of week 9	1 week	10
4	Class test 2*	week 11	60 minutes	25
CPA	Compensation Assessment*	Week 13	60 minutes	25
5	Final Assessment **	Week 14-17	120 minutes	30

****MCQ will be conducted through class marker online tool**
*****mandatory; refer to guidelines on page 5**

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

Feedback about the course will be collected by institute through student's MIS portal

COURSE POLICY (including compensation assessment to be specified)

MODE OF CORRESPONDANCE (E-mail/phone)

Students can meet the course faculty in Department of Energy and Environment (DEE-MAIN) or contact at godwin@nitt.edu, dkarthik@nitt.edu.

COMPENSATION ASSESSMENT POLICY

Compensation assessment will be conducted only for students who miss in mid semester examination on valid/genuine reasons of medical or other emergencies.

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, IF ANY

Text Books and Reference

1. M. W. Zemansky, Heat and Thermodynamics 4th Edn. McGraw Hill, 1968.
2. A. L. Prasuhn, Fundamentals of Fluid Mechanics, Prentice Hall, 1980
3. S. P. Sukhatme, A Text book on Heat Transfer, Orient Longman, 1979.
4. P. C. Sen, Modern Power Electronics, Wheeler, New Delhi, 1998.
5. N. Balbanian, T. A. Bickart, Electrical network theory, John Wiley, New York,

1969

6. B. L. Theraja, A. K. Theraja, Text-book of electrical technology: in S.I. units: v.2 AC and DC machines, Nirja Construction & development, New Delhi, 1988.

FOR APPROVAL

Course Faculty	CC- Chairperson	HOD

Guidelines

a) The number of assessments for any theory course shall range from 4 to6.
b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall beconsidered.
d) The passing minimum shall be as per theregulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all thecourses.
f) Absolute grading policy shall be incorporated if the number of students per course is less than10.
g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.