

**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

<b>COURSE OUTLINE TEMPLATE</b>			
<b>Course Title</b>	<b>Power Generation Systems</b>		
<b>Course Code</b>	<b>EEPE10</b>	<b>No. of Credits</b>	<b>3</b>
<b>Department</b>	<b>Electrical and Electronics Engineering</b>	<b>Faculty</b>	<b>K. Dileep</b>
<b>Pre-requisite Course</b>	<b>Nil</b>		
<b>Course Coordinator</b>	<b>----</b>		
<b>E-mail</b>	<b>dileep@nitt.edu</b>	<b>Telephone No.</b>	<b>+919790636510</b>
<b>Course Type</b>	<b>Elective course</b>		
<b>COURSE OVERVIEW</b>			
<p>Energy is vital for all living beings on earth. Modern life-style has increased its importance, since a faster life means faster transport, faster communication and faster manufacturing processes. All these lead to an increase in energy demand for all those modern systems. There have been significant developments and advances in the field of power generation systems, computer applications on energy audit and management, environmental audit and management, human development and environment. This course is for the benefit of students of engineering because upon completion of the course they get acquainted with different types of power generation systems. Students will be taught about the working of different types of power generation systems. Students will realize the necessity for interconnected operation of different power stations.</p>			
<b>COURSE OBJECTIVES</b>			
<p>To understand the working of different types of power generation systems and to realize the necessity for interconnected operation of different power stations.</p>			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>		<b>Aligned Programme Outcomes (PO)</b>	
<p>On completion of the course the students will be able to</p> <p>1. Appreciate the different types of tariff, consumers and different types of power generation plants.</p>		<p><b>PO<sub>1</sub>, PO<sub>2</sub>, PO<sub>5</sub>, PO<sub>8</sub>, PO<sub>9</sub>, PO<sub>10</sub></b></p>	

2. Determine the significance of various components of the power generation plants.	PO <sub>1</sub> , PO <sub>2</sub> , PO <sub>5</sub> , PO <sub>8</sub> , PO <sub>9</sub> , PO <sub>10</sub> PO <sub>11</sub> , PO <sub>12</sub> , PO <sub>13</sub> , PO <sub>14</sub>
3. Correlate the importance of interconnected operation of different power generation systems.	PO <sub>1</sub> , PO <sub>2</sub> , PO <sub>5</sub> , PO <sub>8</sub> , PO <sub>9</sub> , PO <sub>10</sub> PO <sub>11</sub> , PO <sub>12</sub> , PO <sub>13</sub> , PO <sub>14</sub>
4. Plan an appropriate scheduling of electric power to satisfy the demand constraint.	PO <sub>1</sub> , PO <sub>2</sub> , PO <sub>5</sub> , PO <sub>8</sub> , PO <sub>9</sub> , PO <sub>10</sub> PO <sub>11</sub> , PO <sub>12</sub> , PO <sub>13</sub> , PO <sub>14</sub>

**COURSE TEACHING AND LEARNING ACTIVITIES**

S. No.	Week	Topic	Mode of Delivery
1.	Week 1 10-7-17 to 14-7-17 (3 contact hours)	<b>UNIT-I</b> Hydro-electric power plants – selection of site, elements of power plant, classification	Lecture - Chalk & Talk / PPT or any suitable mode
2.	Week 2 17-7-17 to 21-7-17 (3 contact hours)	Hydro-electric power plants - water turbines, governor action,	
3.	Week 3 24-7-17 to 28-7-17 (3 contact hours)	Hydro-electric generator, plant layout, pumped storage plants. <b>UNIT-II</b> Thermal steam power plants – selection of site, elements and operational circuits of the power plant	
4.	Week 4 31-7-17 to 4-8-17 (3 contact hours)	Thermal steam power plants - Turbo-alternator, plant layout, steam turbines	Lecture - Chalk & Talk / PPT or any suitable mode
5.	Week 5 7-8-17 to 11-8-17 (3 contact hours)	Thermal steam power plants - controls and auxiliaries.	
6.	Week 6 14-8-17 to 18-8-17 (1 contact hour)	ASSESSMENT - 1	
7.	Week 6 14-8-17 to 18-8-17 (2 contact hours)	<b>UNIT-III</b> Nuclear power plants – selection of site, nuclear reaction – fission process and chain reaction	Lecture - Chalk & Talk / PPT or any suitable mode
8.	Week 7 21-8-17 to 25-8-17 (3 contact hours)	Nuclear power plants - constituents of power plant and layout, nuclear reactor – working	Lecture - Chalk & Talk / PPT or any suitable mode



9.	Week 8 28-8-17 to 1-9-17 (3 contact hours)	Nuclear power plants - classification, control, shielding and waste disposal.		
10.	Week 9 4-9-17 to 8-9-17 (3 contact hours)	<b>UNIT-IV</b> Renewable power plants – Solar power generation – Photo-voltaic and solar thermal		
11.	Week 10 11-9-17 to 15-9-17 (3 contact hours)	Solar concentrators, Wind power generation – types of wind mills, wind generators, tidal, biomass, geothermal		
12.	Week 11 18-9-17 to 22-9-17 (3 contact hours)	Magneto-hydro dynamic power generation, micro-hydel power plants, fuel cells and diesel and gas power plants		
13.	Week 12 25-9-17 to 29-9-17 (1 contact hour)	ASSESSMENT - 2		
14.	Week 12 25-9-17 to 29-9-17 (2 contact hour)	<b>UNIT-V</b> Combined operation of power plants – plant selection, choice of size and number of generator units, interconnected systems	Lecture - Chalk & Talk / PPT or any suitable mode	
15.	Week 13 2-10-17 to 6-10-17 (3 contact hours)	Real and reactive power exchange among interconnected systems. Major electrical equipment in power plants, DC systems in power plants	Lecture - Chalk & Talk / PPT or any suitable mode	
16.	Week 14 9-10-17 to 13-10-17 (3 contact hours)	Station control - switch yard and control room. Economic considerations – types of costs, tariff and consumers.		
17.	3 <sup>rd</sup> Week of October 17 (1 hour)	RETEST / COMPENSATION EXAM		
18.	3 <sup>rd</sup> Week of November 17 (3 hours)	FINAL ASSESSMENT		
<b>COURSE ASSESSMENT METHODS</b>				
S. No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assessment-I Written test	6 <sup>th</sup> Week	60 minutes	20
2.	Assessment-II Written test	12 <sup>th</sup> Week	60 minutes	20

3.	Assignment / Seminar	Work will be carried out during contact hours		10
4.	Retest / Compensation Exam	3 <sup>rd</sup> Week of October		20
4.	Final Assessment Written test	3 <sup>rd</sup> Week of November	180 minutes	50

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

**Text Books:**

1. Chakrabarti A., Soni M.L., Gupta P.V., and Bhatnagar U.S., 'A Text Book on Power Systems Engg', Dhanpat Rai and Sons, New Delhi, 2nd Revised Edition, 2010.
2. J.B. Gupta, 'A Course in Power Systems', S.K. Kataria and Sons, Reprint 2010-2011.
3. B.R. Gupta, 'Generation of Electrical Energy', S. Chand Limited, 2009

**Reference Books:**

1. Wadhwa, C.L., 'Generation Distribution and Utilization of Electrical Energy', New Age International Publishers, 3rd Edition, 2010.
2. Deshpande M.V, 'Elements of Electrical Power Systems Design', Pitman, New Delhi, PHI Learning Private Limited, 1st Edition, 2009.

**COURSE EXIT SURVEY**

1. Students' feedback through class committee meetings
2. Feedback questionnaire from students – twice during the semester
3. Feedback from students on Course Outcomes at the end of the semester

**COURSE POLICY**

1. All the students are expected to attend all the contact hours. Anyhow attendance is not expected for discussion classes on video lectures.
2. Students who fall short of 75% attendance to the contact hours are not eligible to appear for the final written examination.
3. No retest / compensation exam will be conducted for those students who are being physically absent for any of the evaluation / assessment methods. Anyhow flexibility is given to the students to fix the date for each mode of evaluation convenient to all the students. In case of emergency, the student may be allowed to appear for retest / compensation exam and should score more than 50% to make them eligible to appear for end semester exam, on submission of appropriate documents as proof.
4. Minimum marks for passing this course and grading pattern will adhere to the regulations of the institute.
5. In case of any student found guilty indulging in any mal practice, he/she will be awarded no marks in that particular assessment. If found using mobile phones or any other gadgets for any mal-practice



during the final written examination, the answer sheet of the student will not be evaluated and will be awarded ZERO marks in the final written examination.

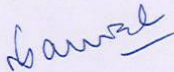
**ADDITIONAL COURSE INFORMATION**

1. The Course Coordinator is available for consultation during the time intimated to the students then and there.
2. All correspondence will be sent to the webmail id of the students alone. Hence all students are advised to check their webmail ids regularly.
3. The students will communicated through the email id: dileep@nitt.edu for any academic related issues (including sharing of study materials) with respect to this course.

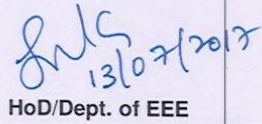
**FOR SENATE'S CONSIDERATION**



[K. Dileep, TF/EEE]  
Course Faculty



[Dr. S. Arul Daniel ]  
CC-Chairperson



13/07/2017

HoD/Dept. of EEE