

Date: 06.04.2011

**NATIONAL POWER TRAINING INSTITUTE**

(Ministry of Power, Govt. of India)

**NPTI Complex, Sector – 33, Faridabad - 121003**

**Tele fax: +91 129-2255213**

**E-mail:snpandey3@gmail.com**

**Request for Application / Proposal**

*For*

**Engagement of**

**Guest Faculty / Consultants / Authors /  
Course Directors / Conference  
Organisers / Monitors etc.**



Advt. No. BDD/02/11

Date: 06.04.2011

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**REQUIREMENT OF GUEST FACULTY / CONSULTANTS /  
AUTHORS / COURSE DIRECTORS / CONFERENCE  
ORGANISERS / MONITORS ETC.**

National Power Training Institute (NPTI) is an autonomous institute under Ministry of Power, Govt. of India, and is National Apex Body for Human Resource Development in Power Sector for the past four decades. NPTI has ambitious growth plans. To meet this objective, NPTI needs Guest Faculty / Consultants / Authors / Course Directors / Conference Organisers / Monitors etc. for its various activities related to training programs etc. in the area of (i) Thermal Power Plant Engineering (ii) Hydro Power Plant Engineering (iii) Renewable Energy Technologies, (iv) Transmission and Distribution (v) General Management (vi) IT / Computers (vii) Consultancy work etc. at its different locations throughout the country on contract basis (Full time/Part time). For details please visit our **website** [www.npti.in](http://www.npti.in)

**S.N.Pandey**

**Deputy Director (BDD)**

**NATIONAL POWER TRAINING INSTITUTE**  
(Ministry of Power, Govt. of India)  
**NPTI Complex, Sector – 33, Faridabad - 121003**  
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**REQUIREMENT OF GUEST FACULTY / CONSULTANTS / AUTHORS / COURSE  
DIRECTORS / CONFERENCE ORGANISERS / MONITORS ETC.**

**1.0 ABOUT NPTI**

National Power Training Institute (NPTI) is an autonomous institute under Ministry of Power, Govt. of India, and is National Apex Body for Human Resource Development in Power Sector for the past four decades. NPTI with its Corporate Office at Faridabad operates on an all India basis through its nine Institutes in different zones of the country as per details below:-

**A. Northern Region**

1. NPTI, Corporate Office, Faridabad.
2. NPTI, (Northern Region), Badarpur, New Delhi.
3. NPTI, (Hydro Power Training Centre), Nangal.

**B. Southern Region**

4. NPTI, (Power System Training Institute), Bangalore.
5. NPTI, (Hot Line Training Centre), Bangalore.
6. NPTI, (Southern Region), Neyveli.

**C. Eastern & North Eastern Region**

7. NPTI, (Eastern Region), Durgapur.

8. NPTI, (North Eastern Region), Guwahati.

**D. Western Region**

9. NPTI, (Western Region), Nagpur.

NPTI conducts following industry interfaced academic programs with the objective to create a pool of committed and competent professionals equipped with appropriate technical skills to steer the Indian Power Sector:-

1. Two Year MBA in Power Management approved by AICTE
2. Four Year B.Tech. / B.E Degree in Power Engineering approved by AICTE
3. One Year Post Graduate Diploma Course in Thermal Power Plant Engineering
4. One Year Post Diploma Course in Thermal Power Plant Engineering
5. One Year Post Graduate Diploma in GIS and Remote Sensing (RS)
6. Nine Months Post Graduate Diploma Course in Hydro Power Plant Engineering.
7. Six Months O&M of Transmission and Distribution System for Engineers.

In addition to above, several long-term (16 weeks and above), medium term (5 weeks to 15 weeks) and short-term (1 day to 4 weeks) training programs in the areas of Thermal, Hydro, Transmission & Distribution and Management, Regulatory affairs etc. are being conducted in the various Institutes of NPTI. Customized induction training programs and

refresher training programs for various Power Utilities are also organized round the year.

**2.0 REQUIREMENT OF GUEST FACULTY / CONSULTANTS / AUTHORS / COURSE DIRECTORS / CONFERENCE ORGANISERS / MONITORS ETC.**

NPTI has ambitious growth plans. To meet this objective, NPTI needs Guest Faculty / Consultants / Authors / Course Directors / Conference Organizers / Monitors etc for its various activities related to training programs etc. in the area of (i) Thermal Power Plant Engineering (ii) Hydro Power Plant Engineering (iii) Renewable Energy Technologies, (iv) Transmission and Distribution (v) General Management (vi) IT/Computers (vii) Consultancy work etc. at its different locations throughout the country on contract basis (Full time / Part time) .

**3.0 General conditions:**

**3.1 Regarding requirement of Guest Faculty / Consultants / Authors / Course Directors / Conference Organizers / Monitors etc:**

The Guest Faculty / Consultants / Authors / Course Directors / Conference Organizers / Monitors etc can be retired / working persons / teaching Faculty / Individual Consultant / retired executives/ officers from PSU's/ Government Departments / Private Organizations etc. Various Government / Private Institutes / Engineering Colleges etc can also submit their proposal for making available their present working faculty. Various organizations / institutes who agree to provide existing faculty for the various services as requested can look forward to mutual benefit to their existing faculty / existing students for which NPTI can provide following support on mutually agreed terms:

- (i) Participation of existing faculty of organizations/institutes in

various programs/courses being conducted by NPTI which will keep the knowledge and skills of existing faculty of organizations / institutes updated.

- (ii) NPTI has 500MW Thermal simulator, Combined Cycle Gas Turbine simulator, Hydel simulator and Power system Simulator. NPTI shall provide exposure of simulator facilities to existing faculty of organizations / institutes.
- (iii) Participation of students of organizations / institutes in various programs / courses being conducted by NPTI and exposure of simulator facilities to students of such organizations / institutes. This support by NPTI shall provide an edge to the students of such organizations / institutes in the competitive job market.
- (iv) NPTI can also depute its faculty / consultants to the premises of such organizations / institutes to deliver lectures on the current Power related / Management related subjects which will benefit the faculty / students of such organizations / institutes.
- (v) Any other support as may be required.

The individual should be suitably qualified and have relevant experience in the related area. Guest Faculty / Consultants may be required to work on Full time / Part time basis. Candidates may give their option in this regard.

The faculty / consultants shall have to perform functions like delivering lectures, preparation of syllabus for relevant course as may be required, preparation of course material, preparation of question papers, evaluation of answer sheets.

**3.2** Names of Courses and Locations where faculty is required for delivering lectures, preparation of syllabus for relevant course as may be

required, and preparation of course materials, preparation of question papers, evaluation of answer sheets etc., the relevant cell is left blank and the location where there is no requirement is shown in grey colour.

**3.3** Payment for various work shall be made by NPTI as per NPTI norms or as fixed by NPTI.

**3.4** Interested individuals / organizations / institutes may send their applications in prescribed format only. Applications should be sent to Shri S.N.Pandey, Deputy Director (BDD), National Power Training Institute, NPTI complex, Sector-33, Faridabad-121003 (Haryana).

**3.5 Applicants have necessarily to send their applications by e-mail as well as hard copy in duplicate. Hard copy of the CV shall be marked 'Original' and 'Duplicate', as the case may be and shall be accompanied by pass port size photograph stapled on the top right corner with the name of the applicant written on the backside. Proposal of applicants not complying with this requirement may not be considered.**

**3.6** Applicants may delete the tables / rows / columns for which they are not applying.

**3.7** Applicants are requested to mark star (\*) in the relevant place/cell for which they are applying.

**3.8** Separate Annexure -1 is to be enclosed with every CV of every applicant / individual.

**APPLICATION**  
**SUBMISSION**  
**FORM**

**FORM A: APPLICATION SUBMISSION FORM**  
**(For Applicants applying in individual capacity)**

Date:

To  
The Deputy Director (BDD)  
National Power Training Institute  
NPTI Complex, Sector -33,  
Faridabad – 121 003  
INDIA.  
Telefax: 0129-2255213

Kind Attention: Shri. S.N.Pandey

Sir,

Subject: Proposal for your requirement of Guest Faculty / Consultants / Authors / Course Directors /  
Conference Organisers / Monitors etc.

Name of Applicant :

Address :

Telephone Number (Office) :

Telephone Number (Mobile) :

Fax Number :

E-mail Address :

My CV indicating the areas where I shall be interested to work is also enclosed.

I hereby declare that all the information and statements made in this application / proposal are true and accept that any misinterpretation or false information / documentation contained in it may lead to my disqualification.

I agree that you are not bound to accept my/any application/proposal.

Yours sincerely

Signature:\_\_\_\_\_

Name of Applicant:\_\_\_\_\_

**FORM B:**

**APPLICATION SUBMISSION FORM**

**(Applicable for organizations/institutes and to be submitted on their letterhead)**

Date:

To  
The Deputy Director (BDD)  
National Power Training Institute  
NPTI Complex, Sector -33,  
Faridabad – 121 003  
INDIA.  
Telefax: 0129-2255213

Kind Attention: Shri. S.N.Pandey

Sir,  
Subject: Proposal for your requirement of Guest Faculty / Consultants / Authors / Course Directors / Conference Organisers / Monitors etc.

Name of our Organisation / institute :  
Address :  
  
Telephone Number (Office) :  
Telephone Number (Mobile) :  
Fax Number :  
E-mail Address :

I have been authorized by my Organization/Institute to submit this proposal.

CVs of interested faculty of our organization/institute indicating the areas where the applicant shall be interested to work is also enclosed. This application is being submitted for the following persons of our Organization/Institute.

S. No	Name of Applicant

I hereby declare that all the information and statements made in this application/Proposal are true and accept that any misinterpretation or false information / documentation contained in it may lead to our disqualification.

We agree that you are not bound to accept any application/proposal you receive.

Yours sincerely

Signature:  
Name of Signatory:  
Designation of the Signatory:  
Telephone (Office):  
Telephone (Mobile):  
Fax:  
Email:

## CV FORMAT

Paste passport  
size  
Photograph

Name of Applicant :  
Date of Birth :  
Age :  
Contact Address :

Phone Number (Office) :  
Phone Number (Residence) :  
Mobile Number :  
Email-id :  
Fax Number :

**Educational Qualifications** :

Degree	School / College / University	Course/Discipline	Course Duration		% of Marks Obtained	Remarks
			Year of Entry	Year of Leaving		
10+2						
Graduation						
PG degree / Diploma						
Ph.D						

**Experience Details:**

<b>Name of the Organization</b>	<b>Designation</b>	<b>Date of Joining</b>	<b>Date of Leaving</b>	<b>Place of Posting</b>	<b>Brief details of experience</b>	<b>Remarks</b>

Please indicate your experience /proficiency, special skills as relevant for the assignments for which application is being made

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In case of Guest Faculty/Consultant please indicate the following :

- (i) Whether applicant wants full time assignment
- (ii) Whether applicant wants part time assignment
- (iii) Whether applicant is agreeable for full time assignment or part time assignment as may be decided by NPTI.

This is to certify that the information provided above is corrected to the best of my knowledge and belief.

**(Signature)**

**Note:**

**In case where the application is being made by any organization/institute, in that case for every person, separate CV along with Annexure- 1 has to be submitted.**

**Annexure-1 to CV**

**Applicants may delete the tables/rows/columns for which they are not applying.**

**Applicants are requested to mark star (\*) in the relevant place/cell for which they are applying.**

**(A) Faculty / Consultants for delivering lectures**

Faculty / Consultants are required for delivering lectures on full time / part time basis in the following areas:

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.1	<b>THERMAL POWER PLANT ENGINEERING</b>							
A.1.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.1.2	Power Plant Familiarization							
A.1.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.1.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.1.5	Methodology of Project Implementation: - Appointment of Design Consultant - Appointment of Bid Process Consultant - Appointment of Project Management Consultant - Preparation of Bid Packages - Design of Plant and Preparation of Detail Technical Specifications, - Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,							
A.1.6	Design Aspects of a Power Plant -Civil Aspects							
A.1.7	Design Aspects of a Power Plant - Mechanical Aspects							
A.1.8	Design Aspects of a Power Plant -							

	Electrical Aspects							
A.1.9	Design Aspects of a Power Plant – Control and Instrumentation Aspects							
A.1.10	Power Plant Chemistry							
A.1.11	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							
A.1.12	Quality Assurance and Inspection related issues							
A.1.13	Erection, Commissioning & Testing - Civil Aspects							
A.1.14	Erection, Commissioning & Testing - Mechanical Aspects							
A.1.15	Erection, Commissioning & Testing - Electrical Aspects							
A.1.16	Erection, Commissioning & Testing - Control and Instrumentation Aspects							
A.1.17	Operation & Maintenance aspects-Mechanical Equipment (Boiler)							
A.1.18	Operation & Maintenance aspects-Mechanical Equipment (Turbine)							
A.1.19	Operation & Maintenance aspects-Mechanical Equipment (Balance of Plant Equipments)							
A.1.20	Operation & Maintenance aspects-Electrical Equipments							
A.1.21	Operation & Maintenance aspects-Control and Instrumentation Equipments							
A.1.22	Energy Efficiency in Thermal Power Station							
A.1.23	Thermal Power Plant Simulator							
A.1.24	Global Best Practices in Thermal Engineering in the Area of Design, Construction, Operation and Maintenance							
A.1.25	Super Critical Technology- Salient Aspects							
A.1.26	Clean Development Mechanism (CDM) Concept							
A.1.27	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> </ul>							

	<ul style="list-style-type: none"> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>							
A.1.28	Concept of Power Trading and Power Exchange							
A.1.29	Implementation of UMPPs							
A.1.30	Private Sector Participation in Generation							
A.1.31	Tariff Based Bidding(Case-I and Case-II)							
A.1.32	Overview of Coal Requirements for Power Projects							
A.1.33	Safety Aspects							
A.1.34	Lectures on Various labs and Conducting Practical's in the Labs-Electrical Lab,							
A.1.35	Visit to Manufacturer's works/Project sites							
A.1.36	On the Job Training (The work will involve taking trainees to various organizations and coordinate On the Job Training)							
A.1.37	Setting of Question Papers and Evaluation of Answer sheets – Civil Engineering Aspects							
A.1.38	Setting of Question Papers and Evaluation of Answer sheets – Mechanical Engineering Aspects							
A.1.39	Setting of Question Papers and Evaluation of Answer sheets – Electrical Engineering Aspects							
A.1.40	Setting of Question Papers and Evaluation of Answer sheets – Control and Instrumentation Engineering Aspects							
A.1.41	Obtaining Feedback of Trainees, Analysis of Feedback and preparation of MIS Report for top management							
	<b>PRACTICALS</b>							
A.1.42	Control and Instrumentation Lab							
A.1.43	Computer Lab							
A.1.44	GIS Lab							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Guwahati
A.2	<b>HYDRO POWER PLANT ENGINEERING</b>				
A.2.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).				
A.2.2	Power Plant Familiarization (Types of Dams etc)				
A.2.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.				
A.2.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.				
A.2.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>				
A.2.6	Design Aspects of a Power Plant -Civil Aspects				
A.2.7	Design Aspects of a Power Plant - Mechanical Aspects				
A.2.8	Design Aspects of a Power Plant - Electrical Aspects				
A.2.9	Design Aspects of a Power Plant – Control and Instrumentation Aspects				
A.2.10	Procurement Methodology, Contracting				

	Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.				
A.2.11	Quality Assurance and Inspection related issues				
A.2.12	Erection, Commissioning & Testing - Civil Aspects				
A.2.13	Erection, Commissioning & Testing - Mechanical Aspects				
A.2.14	Erection, Commissioning & Testing - Electrical Aspects				
A.2.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects				
A.2.16	Operation & Maintenance aspects-Mechanical Equipment (Turbine)				
A.2.17	Operation & Maintenance aspects-Mechanical Equipment (Balance of Plant Equipments)				
A.2.18	Operation & Maintenance aspects-Electrical Equipments				
A.2.19	Operation & Maintenance aspects-Control and Instrumentation Equipments				
A.2.20	Energy Efficiency in Hydro Power Station				
A.2.21	Hydro Power Plant Simulator				
A.2.22	Global Best Practices in Hydro Engineering in the area of Design, Construction, Operation and Maintenance				
A.2.23	Private Sector Participation in Generation				
A.2.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- National Hydro Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>				
A.2.25	Concept of Power Trading and Power Exchange				
A.2.26	Clean Development Mechanism (CDM) Concept				
A.2.27	Lectures on Various labs and Conducting Practical's in the Labs- Silt				

	Lab				
A.2.28	Lectures on Various labs and Conducting Practical's in the Labs-Hydro Lab				
A.2.29	Safety Aspects				
A.2.30	Visit to Manufacturer's works/Project sites				
A.2.31	On the Job Training (The work will involve taking trainees to various organizations and coordinate On the Job Training)				
	<b>PRACTICALS</b>				
A.2.32	Hydro and Silt Lab				
A.2.33	Electrical Lab				
A.2.34	Digital Electronics and Communication Lab				
A.2.35	Control and Instrumentation Lab				

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.3	<b>COMBINED CYCLE GAS POWER GENERATION</b>							
A.3.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.3.2	Power Plant Familiarization							
A.3.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.3.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.3.5	Methodology of Project Implementation: - Appointment of Design Consultant - Appointment of Bid Process Consultant							

	<ul style="list-style-type: none"> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>							
A.3.6	Design Aspects of a Power Plant -Civil Aspects							
A.3.7	Design Aspects of a Power Plant - Mechanical Aspects							
A.3.8	Design Aspects of a Power Plant - Electrical Aspects							
A.3.9	Design Aspects of a Power Plant – Control and Instrumentation Aspects							
A.3.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							
A.3.11	Quality Assurance and Inspection related issues							
A.3.12	Erection, Commissioning & Testing - Civil Aspects							
A.3.13	Erection, Commissioning & Testing - Mechanical Aspects							
A.3.14	Erection, Commissioning & Testing - Electrical Aspects							
A.3.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects							
A.3.16	Operation & Maintenance aspects-Mechanical Equipment (Boiler)							
A.3.17	Operation & Maintenance aspects-Mechanical Equipment (Gas Turbine)							
A.3.18	Operation & Maintenance aspects-Mechanical Equipment (Balance of Plant Equipments)							
A.3.19	Operation & Maintenance aspects-Electrical Equipments							
A.3.20	Operation & Maintenance aspects-Control and Instrumentation Equipments							
A.3.21	Energy Efficiency in Gas Based Power Station							
A.3.22	Combined Cycle Gas Turbine Power Plant Simulator							

A.3.23	Global Best Practices in Gas based Power Projects in the Area of Design, Construction, Operation and Maintenance.							
A.3.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>							
A.3.25	Concept of Power Trading and Power Exchange							
A.3.26	Overview of Gas Requirements for Power Projects							
A.3.27	Clean Development Mechanism (CDM) Concept							
A.3.28	Safety Aspects							
A.3.29	Visit to Manufacturer's works/Project sites							
A.3.30	On the Job Training (The work will involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.4	<b>RENEWABLE ENERGY PROJECTS (SOLAR PHOTO VOLTAIC AND SOLAR THERMAL)</b>							
A.4.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							

A.4.2	Power Plant Familiarization							
A.4.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.4.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.4.5	Manufacturing trends in Solar PV industries and leading manufacturers of Solar Equipments, Major Solar projects in India.							
A.4.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>							
A.4.7	Design Aspects of a Power Plant – Solar Photo Voltaic and Solar Thermal							
A.4.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							
A.4.9	Quality Assurance and Inspection related issues							
A.4.10	Erection, Commissioning & Testing Aspects							
A.4.11	Operation & Maintenance aspects-							
A.4.12	Global Best Practices in Solar Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance							
A.4.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> </ul>							

	- Incentives for Solar Projects by Central and State Governments. Concept of Renewable Energy Certificates							
A.4.14	Concept of Power Trading and Power Exchange							
A.4.15	Jawaharlal Nehru National Solar Mission							
A.4.16	Risk and Major challenges in development of Solar Power.							
A.4.17	Clean Development Mechanism (CDM) Concept							
A.4.18	Visit to Manufacturer's works/Project sites							
A.4.19	On the Job Training (The work will involve taking trainees to various organizations and coordinate On the Job Training)							

<b>Subject Code</b>	<b>NAME OF THE SUBJECT / COURSE</b>	<b>Faridabad</b>	<b>Badarpur</b>	<b>Nangal (HPTC)</b>	<b>Neyveli</b>	<b>Durgapur</b>	<b>Guwahati</b>	<b>Nagpur</b>
<b>A.5</b>	<b>RENEWABLE ENERGY PROJECTS (BIO MASS / BIOGAS / COGENERATION)</b>							
A.5.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.5.2	Power Plant Familiarization							
A.5.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.5.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.5.5	Manufacturing trends in Bio Mass industries and leading manufacturer of Bio Mass Equipments, Major Bio Mass							

	projects in India.							
A.5.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>							
A.5.7	Design Aspects of a Power Plant							
A.5.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							
A.5.9	Quality Assurance and Inspection related issues							
A.5.10	Erection, Commissioning & Testing Aspects							
A.5.11	Operation & Maintenance aspects-							
A.5.12	Global Best Practices in Bio Mass Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance							
A.5.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Bio Mass Projects by Central &amp; State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>							
A.5.14	Concept of Power Trading and Power Exchange							
A.5.15	Risk and Major challenges in development of Bio Mass Projects.							
A.5.16	Clean Development Mechanism (CDM) Concept							

A.5.17	Visit to Manufacturer's works/Project sites							
A.5.18	On the Job Training (The work will involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.6	<b>RENEWABLE ENERGY PROJECTS (WIND)</b>							
A.6.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.6.2	Power Plant Familiarization							
A.6.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.6.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.6.5	Manufacturing trends in Wind Turbines and leading manufacturer of Wind Turbines, Major Wind projects in India.							
A.6.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>							

A.6.7	Design Aspects of a Wind Power Project.							
A.6.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							
A.6.9	Quality Assurance and Inspection related issues							
A.6.10	Erection, Commissioning & Testing Aspects							
A.6.11	Operation & Maintenance aspects-							
A.6.12	Global Best Practices in Wind Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance							
A.6.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Wind Projects by Central and State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>							
A.6.14	Concept of Power Trading and Power Exchange							
A.6.15	Risk and Major challenges in development of Wind Power Projects.							
A.6.16	Clean Development Mechanism (CDM) Concept							
A.6.17	Visit to Manufacturer's works/Project sites							
A.6.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.7	<b>RENEWABLE ENERGY PROJECTS (SMALL HYDRO)</b>							
A.7.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.7.2	Power Plant Familiarization							
A.7.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.							
A.7.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.							
A.7.5	Manufacturing trends in Small Hydro Projects and leading manufacturer of Small Hydro Project Equipments, Major Small Hydro projects in India.							
A.7.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>							
A.7.7	Design Aspects of a Small Hydro Power Project.							
A.7.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.							

A.7.9	Quality Assurance and Inspection related issues							
A.7.10	Erection, Commissioning & Testing Aspects							
A.7.11	Operation & Maintenance aspects-							
A.7.12	Global Best Practices in Small Hydro Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance							
A.7.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Small Hydro Projects by Central and State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>							
A.7.14	Concept of Power Trading and Power Exchange							
A.7.15	Risk and Major challenges in development of Small Hydro Power Projects.							
A.7.16	Clean Development Mechanism (CDM) Concept							
A.7.17	Visit to Manufacturer's works/Project sites							
A.7.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Neyveli	Durgapur	Guwahati	Nagpur
A.8	<b>ADVANCED POWER GENERATION TECHNOLOGIES</b>							
A.8.1	Super Critical Technologies							
A.8.2	Futuristic Technologies							
A.8.3	Fluidized Bed Technology							
A.8.4	Energy Storage							
A.8.5	Recent Trends in Power Generation							
A.8.6	Integrated Gasification Combined Cycle (IGCC)							
A.8.7	Distributed Generation							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
A.9	<b>POWER TRANSMISSION AND SUB STATION SYSTEM</b>							
A.9.1	Overview of Power Scenario in India (Growth of Power Sector and Transmission since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).							
A.9.2	Over view of Transmission system and Sub Station System							
A.9.3	DPR Preparation including Environmental Impact Assesment, Route selection Site Selection, Sub Station Layout Layout etc.							
A.9.4	Transmission Line Survey techniques based on GIS and Satellite Imagery							

	system								
A.9.5	Methodology of Project Appraisal and Sanction of Loans by Lenders.								
A.9.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>								
A.9.7	Design Aspects of a Transmission System and Sub Station System –Civil Aspects								
A.9.8	Design Aspects of a Transmission System and Sub Station System – Mechanical and Electrical Aspects								
A.9.9	Design Aspects of a Sub Station – Control and Instrumentation Aspects								
A.9.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.								
A.9.11	Quality Assurance and Inspection related issues								
A.9.12	Erection, Commissioning & Testing – Civil Aspects								
A.9.13	Erection, Commissioning & Testing – Mechanical and Electrical Aspects								
A.9.14	Erection, Commissioning & Testing – Control and Instrumentation Aspects								
A.9.15	Operation & Maintenance aspects of Transmission line and Sub Station								
A.9.16	Power System Simulator								
A.9.17	Global Best Practices in Transmission and Sub Station in the Area of Design, Construction, Operation and Maintenance, R & D Initiatives								

A.9.18	Private Sector Participation in Transmission							
A.9.19	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- Open Access</li> </ul>							
A.9.20	Concept of Power Trading and Power Exchange							
A.9.21	Transmission System and Sub Station System							
A.9.22	HVDC transmission System							
A.9.23	FACTS, SVC and Reactive Power Management							
A.9.24	SCADA system							
A.9.25	SMART Grid							
A.9.26	Hot Line Transmission Maintenance and Insulator Washing System							
A.9.27	Emergency restoration System							
A.9.28	Gas Insulated Sub Stations (GIS)							
A.9.29	Safety Aspects							
A.9.30	Visit to Manufacturer's works/Project sites							
A.9.31	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
<b>A.10</b>	<b>DISTRIBUTION SYSTEM</b>							
A.10.1	Overview of Power Scenario in India (Growth of Power Sector and Transmission and Distribution since Independence, Role							

	of Ministry of Power, CPSUs, State Undertakings, DISCO's, Private Companies, Role of SERCs, Trading and Power Exchanges etc).								
A.10.2	DPR Preparation Methodology								
A.10.3	Distribution Line Survey techniques								
A.10.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.								
A.10.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>								
A.10.6	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) –Civil Aspects								
A.10.7	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) –Mechanical and Electrical Aspects								
A.10.8	Design Aspects of a Sub Station –Control and Instrumentation Aspects								
A.10.9	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.								
A.10.10	Quality Assurance and Inspection related issues								
A.10.11	Erection, Commissioning & Testing – Civil Aspects								
A.10.12	Erection, Commissioning & Testing – Mechanical and Electrical Aspects								
A.10.13	Erection, Commissioning & Testing – Control and Instrumentation Aspects								
A.10.14	Operation & Maintenance aspects of Distribution line and Sub Station								
A.10.15	SCADA System								
A.10.16	Global Best Practices in Distribution and Sub Station in the Area of Design,								

	Construction, Operation and Maintenance, R & D Initiatives, AT&C Loss Reduction techniques.							
A.10.17	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- SERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- ARR Calculation</li> <li>- Open Access</li> </ul>							
A.10.18	Concept of Power Trading and Power Exchange							
A.10.19	Reactive Power Management							
A.10.20	SMART Grid							
A.10.21	Hot Line Transmission Maintenance and Insulator Washing System							
A.10.22	Gas Insulated Sub Stations (GIS)							
A.10.23	R-APDRP Scheme							
A.10.24	RGVY							
A.10.25	Private Sector Participation in Distribution							
A.10.26	Safety Aspects							
A.10.27	Visit to Manufacturer's works/Project sites							
A.10.28	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)							

Subject Code	NAME OF THE SUBJECT / COURSE	Bengaluru (PSTI)
A.11	<b>POWER SYSTEM OPERATION</b> (Faculty shall also prepare study material, deliver lectures, prepare presentation and model question paper / Question bank.)	
A.11.1	Power Sector overview-India – 3hrs Electricity Supply chain, components of the Power System, Sources of Power: Hydro, Thermal, Nuclear, Gas, Renewable. Distribution of energy sources in the country, Institutional frame work, Regional grids in	

	India, development of state, regional and national grids. Load Dispatch function, Load Dispatch Centers in India, Control Areas: regional and state power systems, Inter connections, characteristics	
A.11.2	Power Sector overview-International – 3hrs System Operation – International Practices: PJM, USA, NGC, UK, Nord Pool, ETSO, NEMMCO, Australia	
A.11.3	Policy, Legislation – 6hrs Legal Framework, policies & regulations: Electricity Act 2003 (organizational set up in India, National Electricity Policy, Tariff Policy, Grid connectivity standards, Grid Standards Regulations, Metering Regulations	
A.11.4	Regulations – 12 hrs Regulatory Framework ERC Regulations and Comparative study of Regulations of Central and State ERCs: Indian Electricity Grid Code (IEGC), Open Access Regulations, Terms and conditions of Tariff, unscheduled interchange regulations, congestion charge regulations, other regulations, activities of forum of regulators	
A.11.5	Power System Operation –18 hrs Characteristics of Thermal, Hydro, Gas, Nuclear, renewable power plants. Overview of Generators, components, basic operating principles, rotational speed. Substations: Layout, Equipment, Bus arrangements. Circuit Breakers: Types, construction, operation, selection and sizing, Transformers: Physical construction cooling arrangements, Tap changers, auto transformers The effect of transmission line conductor resistance and inductance, line voltage drop and power angle, effect of line loading on voltage drop and power angle, effect of load power factor on voltage drop and power angle The need to generate and provide MVAR, sources and sinks of reactive power, charging current required due to the line shunt capacitance, production of reactive power by line shunt capacitance, Ferranti effect. Line reactive compensation equipment: Reactors, capacitors, Synchronous Condensers and Static VAR compensators Power Quality: Voltage flicker, Voltage swells, Sags, Unbalance; Measurement, Power System Harmonics and mitigation Over view of power system protection, Protection Zones, classification of protection relays, Impedance protection and fault loops, impedance relay characteristics, reactance, impedance, admittance (MHO), quadrilateral, special characteristics, faults affecting impedance relay performance, fault resistance, load encroachment, remote in feed, mutual induction, System protection schemes, Protection for abnormal frequency and voltages,	
A.11.6	Electricity Market Operation – 12 hrs Fundamentals of Electricity markets: Restructuring, Corporatization, privatization, competitive markets – pricing mechanisms, regulated markets, impact of	

	<p>transmission and system operation on electricity markets</p> <p>Whole Sale market design: Bilateral contracts, organized trading, market abuse and its mitigation: Market power and its evaluation, implications of market abuse, detection and avoidance of market abuse</p> <p>Metering and settlement: Measurement principles, meter placement, meter data collection, validation and processing, preparation of energy accounts billing, regional energy account, unscheduled interchange account, reactive energy account, congestion rent.</p> <p>Day – ahead resource scheduling: load forecasting, preparation of daily schedules, shortages, base load stations, peaking stations, must – run stations, generation location &amp; effect on losses, open access: Bilateral contracts and power exchange transactions.</p> <p>Commercial &amp; Economic Aspects: Introduction to Power System Economics, Electricity Markets, Pool Operation Co-ordinated multilateral trading model, power exchanges, capacity &amp; energy markets, balancing mechanism, ancillary services market Settlement system – ABT &amp; UI, modalities for access to transmission: Long term, Medium term, Short term</p>	
A.11.7	<p>System Logistics (SCADA/IT) – 6hrs SCADA / EMS: Overview, architecture, main components, Hardware-overview, System software – Displays, Database; Disturbance data collection modules / HDR retrieval &amp; playback, HIM, Trends, Alarms, Health check, trouble shooting</p> <p>Communication systems: Overview – VSAT, Microwave, Optical fiber etc., hardware protocols, Configuration, Communication network</p> <p>Information Technology tools: MS word, MS Excel, MS Power Point, MS Access, MS Outlook, E-mail, use of Internet</p>	
A.11.8	<p>Energy Management System – 6hrs Energy Management System: Load forecasting- similar day forecast, weather based load forecast, historical data, Network study- Network modeling; special devices like HVDC, FSC, Pumped storage; network reduction &amp; equivalence, state estimation – techniques, detection &amp; identification of bad measurement, network observability, Optimal power flow-cost optimization, loss optimization, control optimization, voltage &amp; VAR scheduling, unit commitment, contingency analysis</p> <p>Power system reliability: Adequacy – Long term planning, procurement security, states of power system – normal, alert, emergency, restorative, planning criteria, connectivity standards, grid standards, grid code, power system equipment capacity &amp; limits, Transmission capacity &amp; transfer capability, ATC in planning and operating time frames, Requirement of reliability co-ordinators at organizational level</p>	

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
A.12	<b>ENERGY CONSERVATION AND ENERGY AUDIT</b>								
A.12.1	Energy Conservation Act 2001								
A.12.2	Identifying basic potential of conservation of Energy								
A.12.3	Thermal Energy System								
A.12.4	Electrical Energy System								
A.12.5	Energy Balancing								
A.12.6	Energy Management								
A.12.7	Energy Audit								
A.12.8	Audit for Buildings & Commercial Complexes								
A.12.9	Industrial Energy Audit								
A.12.10	Methodologies for Energy audit								
A.12.11	Energy Audit for Generation, Transmission and Distribution Utilities								
A.12.12	Incentives for Energy Conservation								
A.12.13	Energy Efficient Equipment and Technologies								

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
A.13	<b>ENVIRONMENT MANAGEMENT AND POLLUTION CONTROL</b>								
A.13.1	Energy and Ecology								
A.13.2	Legislation & standards for Noise, Air and Water Pollution								
A.13.3	Environmental Protection Act (EPA)-1986								

A.13.4	Water pollution.									
A.13.5	Air Pollution caused by coal & oil									
A.13.6	Demonstration of Air quality monitor									
A.13.7	Disease caused due to thermal power plant pollution and other impact.									
A.13.8	Environnemental Impact Asses ment									
A.13.9	Environnemental Audit.									
A.13.10	Environnemental Issues in Power Sector									
A.13.11	Visit to Manufacturer's works/Project sites									

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
<b>A.14</b>	<b>GENERAL MANAGEMENT</b>								
A.14.1	Finance for non Finance Exécutives								
A.14.2	HR management								
A.14.3	Finance Management								
A.14.4	Materials Management								
A.14.5	Procurent Procédures								
A.14.6	Procurement Under World Bank guidelines								
A.14.7	E-Procurement								
A.14.8	Project Financing								
A.14.9	Power Trading Exchanges and Open Access								
A.14.10	Legal Aspects in Contract Management								
A.14.11	Accountancy								
A.14.12	Managerial Economics								
A.14.13	Operation Management								
A.14.14	Management Information system								
A.14.15	Business Communication Skills								
A.14.16	Power Plant Familiarization for Technical Personnel (Thermal , Hydel and Gas)								
A.14.17	Power Plant Familiarization for Non Technical personnel (Thermal , Hydel and Gas)								
A.14.18	Familiarization with Transmission and Distribution System for Non Technical personnel								

A.14.19	Delegation of Powers								
A.14.20	Disciplinary and Vigilance Procedures								
A.14.21	Corporate Social Responsibility								
A.14.22	Reservation Policy								
A.14.23	Seven Habits of Highly Effective people								
A.14.24	Training of Trainers in Communication Skills								
A.14.25	Leadership Skills								
A.14.26	How to enhance productivity in an Organization								
A.14.27	ERP								
A.14.28	Communication skills and public speaking								
A.14.29	Clean Development Mechanism (CDM) Concept								
A.14.30	Geographical Information System (GIS) applications								

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
<b>A.15</b>	<b>COMPUTER RELATED COURSES</b>								
A.15.1	Microsoft Word								
A.15.2	Microsoft Excel								
A.15.3	Microsoft Power Point								
A.15.4	Photo Shop								
A.15.5	Note pad								
A.15.6	Word Pad								
A.15.7	SMART draw								
A.15.8	Auto CAD								
A.15.9	Coral Draw								
A.15.10	Primavera								
A.15.11	MS Project								
A.15.12	MS Access								
A.15.13	Computer Hardware								
A.15.14	Computer Networking (LAN / WAN etc.)								

Subject Code	NAME OF THE SUBJECT / COURSE	Badarpur	Durgapur	Nagpur
A.16	<b>B.TECH (Power Engineering)</b>			
	<b>Theory</b>			
A.16.1	English Language & Communication			
A.16.2	Mathematics			
A.16.3	Engineering Physics			
A.16.4	Chemistry			
A.16.5	Manufacturing Process			
A.16.6	Introduction to Computers			
A.16.7	Communication Skills			
A.16.8	Mechanical Sciences			
A.16.9	Basic Electrical Engineering			
A.16.10	Environment & Ecology			
A.16.11	Social Science			
A.16.12	Engineering Drawing			
A.16.13	Workshop			
A.16.14	Engineering Mechanics			
A.16.15	Electrical Engineering			
A.16.16	Introduction to Programming			
A.16.17	Basic Electronics Engineering			
A.16.18	Material Science& Metallurgy			
A.16.19	Thermodynamics			
A.16.20	Circuit Theory			
A.16.21	Analog Electronics			
A.16.22	Electrical Machines			
A.16.23	Fluid Mechanics			
A.16.24	Mechanics of Deformable Bodies			
A.16.25	Electrical Electronic Measurement			
A.16.26	Manufacturing Process			
A.16.27	Network Analysis			
A.16.28	Electronic Devices & Circuits			
A.16.29	Engineering Economics			
A.16.30	Energy Conversion			
A.16.31	Heat & Mass Transfer			
A.16.32	Digital Electronics & Integrated circuits			
A.16.33	Control Engineering			
A.16.34	Theory of Machines			
A.16.35	Power Generation Engineering			
A.16.36	Steam Generator and Its Auxiliaries			

A.16.37	Steam Turbine And its Auxiliaries			
A.16.38	Power System			
A.16.39	Operation Research			
A.16.40	Renewable Energy Systems			
A.16.41	Hydro Power Generation			
A.16.42	Nuclear Power Generation			
A.16.43	Heat Transfer			
A.16.44	Microprocessor and Microcontrollers			
A.16.45	Auto Control			
A.16.46	Thermal Power Station Layout,			
A.16.47	Environmental Management Power plant visits			
A.16.48	Power Plant Operation			
A.16.49	Power Plant Control and Instrumentation			
A.16.50	I.C. Engines & Gas Dynamics			
A.16.51	Power Electronics & Electric Drives			
A.16.52	Electrical Equipment in Power Station			
A.16.53	Power Transmission and Distribution			
A.16.54	Refrigeration and Air Conditioning			
A.16.55	High Voltage Engineering			
A.16.56	Energy Conversion			
A.16.57	Thermal Power Plant Control & Instrumentation			
A.16.58	Power generation technology			
A.16.59	Steam Generators & its Aux.			
A.16.60	Power Distribution and Utilization			
A.16.61	Power Plant Maintenance			
A.16.62	Power System Analysis & Stability			
A.16.63	Manufacturing & Industrial Engineering			
A.16.64	Civil Works in Power Engineering			
A.16.65	Design of Mech. Equipments OR			
A.16.66	Design of Electrical Equipments			
A.16.67	Steam turbine & its Auxillaries			
A.16.68	Turbo Generator and its Auxiliaries.			
A.16.69	Energy Conversion			
A.16.70	Load dispatch and regulatory issues			
A.16.71	Environmental management, energy conversion			
A.16.72	Management concepts and techniques			
A.16.73	Mechanical vibration OR Design of electrical machines			
A.16.74	HVDC Technology			
A.16.75	Switchgear & Protections			
A.16.76	Thermal Power Plant Operation & Performance			
A.16.77	Power Plant Maintenance and Practices			
A.16.78	Power plant operation practices			
	<b>PRACTICALS</b>			
A.16.79	Applied Physics			
A.16.80	Applied Chemistry			

A.16.81	Introduction to Auto CAD office Automation and Web Design			
A.16.82	Workshop Practice			
A.16.83	Engineering Graphics Lab			
A.16.84	Computer Programming Lab			
A.16.85	Engineering Mechanics Lab			
A.16.86	Electrical Science Lab			
A.16.87	Thermodynamics Lab			
A.16.88	Strength of Materials & Theory of Machines Lab			
A.16.89	Circuit Theory Lab			
A.16.90	Analog Electronics Lab			
A.16.91	Electrical Machines Lab			
A.16.92	Heat and Mass Transfer Lab			
A.16.93	Fluid Mechanics & Machines Lab			
A.16.94	Digital Electronics Lab			
A.16.95	Control Engineering Lab			
A.16.96	Microprocessor Lab			
A.16.97	Refrigeration and Air conditioning Lab			
A.16.98	Electrical and Electronics Measurements Lab			
A.16.99	Power System Protection and Switchgear Lab			
A.16.100	I. C. Engine Lab			
A.16.101	Power Electronic and Electric Drives Lab			
A.16.102	Power System Lab			
A.16.103	Environmental and Energy Audit Lab			
A.16.104	MATLAB			

Subject Code	NAME OF THE SUBJECT / COURSE	Faridabad
<b>A.17</b>	<b>MBA (POWER MANAGEMENT)</b>	
A.17.1	Management Concepts & Applications	
A.17.2	Managerial Economics	
A.17.3	Organizational Behavior	
A.17.4	Quantitative Analysis	
A.17.5	Accounting for Managers	
A.17.6	Business Communication Skills	
A.17.7	Business environment	
A.17.8	Energy Resources and Conversions and Power plant system	
A.17.9	Financial Management	

A.17.10	Marketing Management	
A.17.11	Human Resource Management	
A.17.12	Operations & supply Chain Management	
A.17.13	Business Research Methods	
A.17.14	Operations research	
A.17.15	Electricity Industry structure and regulations	
A.17.16	Management of power transmission and distribution	
A.17.17	Strategic Management	
A.17.18	Management Information System	
A.17.19	Business Legislation	
A.17.20	Power Environment Interface	
A.17.21	Summer training Report	
A.17.22	Project Management and infrastructure Finance	
A.17.23	Management of Financial institutions and Services	
A.17.24	Strategies Cost Management and Control	
A.17.25	Organizational change and Development Performance Management	
A.17.26	Power station management	
A.17.27	Risk and Hazard Management	
A.17.28	Hydro Power resources management	
A.17.29	Energy Conservation and Energy audit	
A.17.30	Entrepreneurship	
A.17.31	E-Commerce	
A.17.32	Power pricing and power purchase Agreements	
A.17.33	Integrated Energy management and power Planning	
A.17.34	Security Analysis and Portfolio Management	
A.17.35	Financial Derivatives	
A.17.36	Taxation Laws and Planning	
A.17.37	Talent Management	
A.17.38	Customer Relationship Management	
A.17.39	Renewable Energy	
A.17.40	Maintenance Management	
A.17.41	Global Power Business	
A.17.42	Rural Energy development	

**(B) Faculty/Consultants for Preparation of Syllabus**

Faculty/Consultants are required for preparation of detailed syllabus for the courses below or review of existing syllabus of NPTI and preparing modified syllabus. Such Faculty/Consultant shall also be required to prepare daily lecture schedule of the related course.

Code	Name of Course	Coordination at Corporate Office, Faridabad
B.1	Thermal Engineering (Long Term/Medium Term/Short Term Course)	
B.2	Hydro Engineering (Long Term/Medium Term/Short Term Course)	
B.3	Combined Cycle Gas Power Generation (short term course)	
B.4	<p>Renewable energy projects (solar photo voltaic and solar thermal)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
B.5	<p>Renewable energy projects (bio mass / biogas / cogeneration)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
B.6	<p>Renewable energy projects (wind)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p>	

	<p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
B.7	<p>Renewable energy projects (small hydro)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
B.8	Advanced Power Generation Technology (Short Term Course)	
B.9	Power Transmission and Sub Station System (Long Term/Medium Term/Short Term Course)	
B.10	Distribution System (Long Term/Medium Term/Short Term Course)	
B.11	Environnement Management and Pollution Control (Short Term Course)	
B.12	General Management Development program for junior executives (this course may be of about 7-15 days duration)	
B.13	General Management Development program for middle level executives (this course may be of about 7-15 days duration)	
B.14	General Management Development program for senior level executives (this course may be of about 7-15 days duration)	
B.15	Induction Program to the Trainees of various organizations (This course may of duration from 3 weeks to 3 months)	
B.16	Refresher Program to the experienced officers of various organizations (This course may of duration from 3 weeks to 3 months)	

**(C) Faculty/Consultants for Review of Syllabus for the following courses**

Faculty/Consultants are required for review of detailed syllabus as per details below prepared by other faculty/consultant. Such Faculty/Consultants shall also be required to review daily lecture schedule of the related course.

<b>Code</b>	<b>Name of Course</b>	<b>Coordination at Corporate Office</b>
C.1	Thermal Engineering (Long Term/Medium Term/Short Term Course)	
C.2	Hydro Engineering (Long Term/Medium Term/Short Term Course)	
C.3	Combined Cycle Gas Power Generation (short term course)	
C.4	<p>Renewable energy projects (solar photo voltaic and solar thermal)-</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
C.5	<p>Renewable energy projects (bio mass / biogas / cogeneration)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
C.6	<p>Renewable energy projects (wind)</p> <p><b><u>Variant 1</u></b></p>	

	<p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
C.7	<p>Renewable energy projects (small hydro)</p> <p><b><u>Variant 1</u></b></p> <p>Such course to be of about 6 weeks duration and shall include 10 to 15 days visit to manufacturer's works and project sites.</p> <p><b><u>Variant 2</u></b></p> <p>Such course to be of about 3-6 days duration and may include 1/2 days visit to manufacturer's works / project sites.</p>	
C.8	Advanced Power Generation Technology (Short Term Course)	
C.9	Power Transmission and Sub Station System (Long Term/Medium Term/Short Term Course)	
C.10	Distribution System (Long Term/Medium Term/Short Term Course)	
C.11	Environment Management and Pollution Control (Short Term Course)	
C.12	General Management Development program for junior executives (this course may be of about 7-15 days duration)	
C.13	General Management Development program for middle level executives (this course may be of about 7-15 days duration)	
C.14	General Management Development program for senior level executives (this course may be of about 7-15 days duration)	
C.15	Induction Program to the Trainees of various organizations (This course may of duration from 3 weeks to 3 months)	
C.16	Refresher Program to the experienced officers of various organizations (This course may of duration from 3 weeks to 3 months)	

**(D) Faculty/Consultants are required for preparation of FR/DPR who shall also act as Bid Process Consultant and Project Management Consultant in the following areas.**

Their broad scope of work shall be as under:

- (i) To prepare FR/DPR
- (ii) To act as Bid Process Consultant which inter-alia shall include preparation of bid documents, assisting NPTI in evaluation and award etc.
- (iii) To act as Project Management Consultant which inter-alia shall include pre-despatch inspection, Supervision of erection of equipments etc. till commissioning / handing over to NPTI.

Subject Code	DESCRIPTION	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Bengaluru (HLTC)	Neyveli	Durgapur	Guwahati	Nagpur
D.1	Augmentation of Hot Line Training Centre HLTC									
D.2	SCADA Labs									
D.3	800 MW Simulator									
D.4	Up gradation of existing labs of B.Tech / PGDC/Other labs									
D.5	Up gradation / Renovation and Modernization of Civil Structures like office building, hostel building, conference rooms, auditorium, guest house, kitchen etc. (The scope of work shall also include associated equipments / services required like generator power backup supply, fire protection system, video conferencing, audio visual equipment, air conditioning system, etc)									
D.6	Video Conferencing system to link all the nine institutes of NPTI									

D.7	Computerized MIS system for all Institutes including creation of web sites the institutes where it does not exist												
D.8	Assessment of computerization needs of all the Institutes of NPTI												
D.9	Energy Audit lab												
D.10	Environment Management lab												
D.11	Power System lab												
D.12	Upgradation of existing ITIs / Establishment of new ITIs												

**(E) Course Directors/Course Coordinators / Program Directors / Program coordinators**

Course Directors/Course Coordinators/Program Directors/Program coordinators are required for conducting various short term/medium term/ long term courses as per details below. Their scope of responsibility shall include preparation of day wise schedules of lectures, identification of faculty, arranging the faculty, taking charge of the whole program till completion of the course. Such courses may be of duration starting from one day to even more than one month as per the needs of the customers of the NPTI or as per the requirement of NPTI. In case of courses specifically conducted for customers, trainees shall be arranged by the customer organization. In the case of program sponsored by NPTI, which are not sponsored by any customer organization, it will be the responsibility of Course Director/Course Coordinator/Program Director/Program Coordinator to contact various customer organizations and arrange for trainees. The above activities shall be done in consultation with NPTI. NPTI may provide support by way of arranging conference hall, lodging and boarding, availability of vehicles for bringing faculty etc. The programs have to be designed on self sustainable basis. Some programs can also be held in hotels.

Subject Code	DESCRIPTION	Faridabad	Badarpur	Nangal (HPTC)	Bengaluru (PSTI)	Neyveli	Durgapur	Guwahati	Nagpur
E.1	Global best practices in Power Sector. (This program may be of about 2-3 weeks duration and shall consist of 4- 5 days of class room sessions and 10-12 days visit abroad. The Course Director shall identify the topics and arrange faculty. He shall also coordinate with organizations abroad and shall be overall responsible for this program.)								
E.2	Various subjects related to Thermal Power Plant.								
E.3	Various subjects related to Hydro Power Plant.								
E.4	Various subjects related to combined Cycle Gas Power Plant.								
E.5	Various subjects related to Renewable Energy (Solar).								
E.6	Various subjects related to Renewable Energy (Wind).								
E.7	Various subjects related to Renewable Energy (Bio mass).								
E.8	Various subjects related to Renewable Energy (Small Hydro).								
E.9	Advanced power generation tech								
E.10	Various subjects related to power transmission and substation system								
E.11	Various subjects related to distribution system								
E.12	Various subjects related to energy conservation and energy audit								
E.13	Various subjects related to environment management and pollution control								

E.14	Regulatory aspects								
E.15	General Management Development program for junior executives								
E.16	General Management Development program for middle level executives								
E.17	General Management Development program for senior level executives								
E.18	Finance for non finance executives								
E.19	HR Management								
E.20	Computer Related Courses								
E.21	Geographical Information System (GIS)								
E.22	Induction Program to the Trainees of various organizations (This course may of duration from 3 weeks to 3 months)								
E.23	Refresher Program to the experienced officers of various organizations (This course may of duration from 3 weeks to 3 months)								
E.24	Various subjects related to Renewable Energy (Solar). (Distance learning mode / E-learning mode)								
E.25	Various subjects related to Renewable Energy (Wind). (Distance learning mode / E-learning mode)								
E.26	Various subjects related to Renewable Energy (Bio mass). (Distance learning mode / E-learning mode)								
E.27	Various subjects related to Renewable Energy (Small Hydro). (Distance learning mode /E-learning mode)								

**(F) Course Directors / Course Coordinators / Program Directors / Program coordinators for MBA courses**

Course Directors/Course Coordinators/Program Directors/Program coordinators are required for conducting following courses as per details below. Their scope of responsibility shall broadly include the following:

- (i) Obtaining approval of AICTE
- (ii) Obtaining approval of the identified University
- (iii) Identification of faculty, arranging the faculty,
- (iv) Release of the advertisement for admission
- (v) Taking charge of the whole program till completion of the course.

The above activities shall be done in consultation with NPTI. NPTI shall provide support by way of arranging class rooms conference hall, lodging and boarding, availability of vehicles for bringing faculty etc as may be required. The programs have to be designed on self sustainable basis.

<b>Code</b>	<b>Description</b>	<b>Coordination at Corporate Office Faridabad</b>
F.1	Executive MBA program in power management of 12/15 months duration	
F.2	MBA program in power management through correspondence/distance Learning/e-learning	
F.3	3 year Part time MBA program in power management	

**(G) Conference Organizers for National / International conferences**

Conference Organizers for National / International conferences are required for conducting various National / International conferences as per details below. Their scope of responsibility shall include preparation of day wise schedule of topics, identification of renowned speakers, arranging the renowned speakers

and taking charge of the whole conference till completion of the conference. Conference Organizers shall also arrange sponsorship from leading organizations and shall also arrange the participants. Such conference may be of duration of 1/2/3 days as per the requirement. Venue of such conferences can be hotels/NPTI premises. The conferences can be organized at major cities of India or at the cities where NPTI institutes are located. The above activities shall be done in consultation with NPTI. NPTI may provide support by way of arranging printing of brochures, arranging conference hall at NPTI institutes, lodging and boarding, availability of vehicles for bringing speakers etc. The conference has to be designed on self sustainable basis.

<b>Subject Code</b>	<b>NAME OF THE SUBJECT / COURSE</b>	<b>Faridabad</b>	<b>Badarpur</b>	<b>Nangal (HPTC)</b>	<b>Bengaluru (PSTI)</b>	<b>Neyveli</b>	<b>Durgapur</b>	<b>Guwahati</b>	<b>Nagpur</b>
G.1	Various subjects related to Thermal Power Plant.								
G.2	Various subjects related to Hydro Power Plant.								
G.3	Various subjects related to Combined Cycle Gas Power Plant.								
G.4	Various subjects related to Renewable Energy (Solar).								
G.5	Various subjects related to Renewable Energy (Wind).								
G.6	Various subjects related to Renewable Energy (Bio mass).								
G.7	Various subjects related to Renewable Energy (Small Hydro).								
G.8	Advanced Power Generation Technology								
G.9	Various subjects related to Power Transmission And Sub Station System								
G.10	Various Subjects Related to								

	Distribution System								
G.11	Various Subjects Related To Energy Conservation And Energy Audit								
G.12	Various Subjects Related To Environment Management and Pollution Control								
G.13	Regulatory aspects								

**(H) Faculty / Consultants / Authors for preparation of study materials / manuals**

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.1</b>	<b>THERMAL POWER PLANT ENGINEERING</b>	
H.1.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.1.2	Power Plant Familiarization	
H.1.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.1.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.1.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.1.6	Design Aspects of a Power Plant -Civil Aspects	
H.1.7	Design Aspects of a Power Plant -Mechanical Aspects	
H.1.8	Design Aspects of a Power Plant -Electrical Aspects	

H.1.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
H.1.10	Power Plant Chemistry	
H.1.11	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.1.12	Quality Assurance and Inspection related issues	
H.1.13	Erection, Commissioning & Testing - Civil Aspects	
H.1.14	Erection, Commissioning & Testing - Mechanical Aspects	
H.1.15	Erection, Commissioning & Testing - Electrical Aspects	
H.1.16	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
H.1.17	Operation & Maintenance aspects- Mechanical Equipment (Boiler)	
H.1.18	Operation & Maintenance aspects- Mechanical Equipment (Turbine)	
H.1.19	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
H.1.20	Operation & Maintenance aspects- Electrical Equipments	
H.1.21	Operation & Maintenance aspects- Control and Instrumentation Equipments	
H.1.22	Energy Efficiency in Thermal Power Station	
H.1.23	Thermal Power Plant Simulator	
H.1.24	Global Best Practices in Thermal Engineering in the Area of Design, Construction, Operation and Maintenance	
H.1.25	Super Critical Technology- Salient Aspects	
H.1.26	Clean Development Mechanism (CDM) Concept	
H.1.27	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
H.1.28	Concept of Power Trading and Power Exchange	
H.1.29	Implementation of UMPPs	
H.1.30	Private Sector Participation in Generation	
H.1.31	Tariff Based Bidding(Case-I and Case-II)	
H.1.32	Overview of Coal Requirements for Power Projects	
H.1.33	Safety Aspects	
H.1.34	Lectures on Various labs and Conducting Practical's in the Labs- Electrical Lab	
H.1.35	Visit to Manufacturer's works/Project sites	
H.1.36	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

H.1.37	Setting of Question Papers and Evaluation of Answer sheets – Civil Engineering Aspects	
H.1.38	Setting of Question Papers and Evaluation of Answer sheets – Mechanical Engineering Aspects	
H.1.39	Setting of Question Papers and Evaluation of Answer sheets – Electrical Engineering Aspects	
H.1.40	Setting of Question Papers and Evaluation of Answer sheets – Control and Instrumentation Engineering Aspects	
H.1.41	Obtaining Feedback of Trainees, Analysis of Feedback and preparation of MIS Report for top management	
	<b>PRACTICALS</b>	
H.1.42	Control and Instrumentation Lab	
H.1.43	Computer Lab	
H.1.44	Geographical Information System (GIS) Lab	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
H.2	<b>HYDRO POWER PLANT ENGINEERING</b>	
H.2.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.2.2	Power Plant Familiarization (Types of Dams etc)	
H.2.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.2.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.2.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.2.6	Design Aspects of a Power Plant -Civil Aspects	
H.2.7	Design Aspects of a Power Plant -Mechanical Aspects	

H.2.8	Design Aspects of a Power Plant -Electrical Aspects	
H.2.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
H.2.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.2.11	Quality Assurance and Inspection related issues	
H.2.12	Erection, Commissioning & Testing - Civil Aspects	
H.2.13	Erection, Commissioning & Testing - Mechanical Aspects	
H.2.14	Erection, Commissioning & Testing - Electrical Aspects	
H.2.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
H.2.16	Operation & Maintenance aspects- Mechanical Equipment (Turbine)	
H.2.17	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
H.2.18	Operation & Maintenance aspects- Electrical Equipments	
H.2.19	Operation & Maintenance aspects- Control and Instrumentation Equipments	
H.2.20	Energy Efficiency in Hydro Power Station	
H.2.21	Hydro Power Plant Simulator	
H.2.22	Global Best Practices in Hydro Engineering in the area of Design, Construction, Operation and Maintenance	
H.2.23	Private Sector Participation in Generation	
H.2.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- National Hydro Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
H.2.25	Concept of Power Trading and Power Exchange	
H.2.26	Clean Development Mechanism (CDM) Concept	
H.2.27	Lectures on Various labs and Conducting Practical's in the Labs- Silt Lab	
H.2.28	Lectures on Various labs and Conducting Practical's in the Labs- Hydro Lab	
H.2.29	Safety Aspects	
H.2.30	Visit to Manufacturer's works/Project sites	
H.2.31	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	
	<b>PRACTICALS</b>	
H.2.32	Hydro and Silt Lab	

H.2.33	Electrical Lab	
H.2.34	Digital Electronics and Communication Lab	
H.2.35	Control and Instrumentation Lab	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.3</b>	<b>COMBINED CYCLE GAS POWER GENERATION</b>	
H.3.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.3.2	Power Plant Familiarization	
H.3.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.3.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.3.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.3.6	Design Aspects of a Power Plant -Civil Aspects	
H.3.7	Design Aspects of a Power Plant -Mechanical Aspects	
H.3.8	Design Aspects of a Power Plant -Electrical Aspects	
H.3.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
H.3.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.3.11	Quality Assurance and Inspection related issues	
H.3.12	Erection, Commissioning & Testing - Civil Aspects	
H.3.13	Erection, Commissioning & Testing - Mechanical Aspects	
H.3.14	Erection, Commissioning & Testing - Electrical Aspects	

H.3.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
H.3.16	Operation & Maintenance aspects- Mechanical Equipment (Boiler)	
H.3.17	Operation & Maintenance aspects- Mechanical Equipment (Gas Turbine)	
H.3.18	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
H.3.19	Operation & Maintenance aspects- Electrical Equipments	
H.3.20	Operation & Maintenance aspects- Control and Instrumentation Equipments	
H.3.21	Energy Efficiency in Gas Based Power Station	
H.3.22	Combined Cycle Gas Turbine Power Plant Simulator	
H.3.23	Global Best Practices in Gas based Power Projects in the Area of Design, Construction, Operation and Maintenance.	
H.3.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
H.3.25	Concept of Power Trading and Power Exchange	
H.3.26	Overview of Gas Requirements for Power Projects	
H.3.27	Clean Development Mechanism (CDM) Concept	
H.3.28	Safety Aspects	
H.3.29	Visit to Manufacturer's works/Project sites	
H.3.30	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.4</b>	<b>RENEWABLE ENERGY PROJECTS (SOLAR PHOTO VOLTAIC AND SOLAR THERMAL)</b>	
H.4.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.4.2	Power Plant Familiarization	

H.4.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.4.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.4.5	Manufacturing trends in Solar PV industries and leading manufacturers of Solar Equipments, Major Solar projects in India.	
H.4.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.4.7	Design Aspects of a Power Plant – Solar Photo Voltaic and Solar Thermal	
H.4.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.4.9	Quality Assurance and Inspection related issues	
H.4.10	Erection, Commissioning & Testing Aspects	
H.4.11	Operation & Maintenance aspects-	
H.4.12	Global Best Practices in Solar Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
H.4.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Solar Projects by Central and State Governments.</li> </ul> <p>Concept of Renewable Energy Certificates</p>	
H.4.14	Concept of Power Trading and Power Exchange	
H.4.15	Jawaharlal Nehru National Solar Mission	
H.4.16	Risk and Major challenges in development of Solar Power.	
H.4.17	Clean Development Mechanism (CDM) Concept	
H.4.18	Visit to Manufacturer's works/Project sites	
H.4.19	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
H.5	<b>RENEWABLE ENERGY PROJECTS (BIO MASS / BIOGAS / COGENERATION)</b>	
H.5.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.5.2	Power Plant Familiarization	
H.5.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.5.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.5.5	Manufacturing trends in Bio Mass industries and leading manufacturer of Bio Mass Equipments, Major Bio Mass projects in India.	
H.5.6	<p>Methodology of Project Implementation:</p> <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.5.7	Design Aspects of a Power Plant	
H.5.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.5.9	Quality Assurance and Inspection related issues	
H.5.10	Erection, Commissioning & Testing Aspects	
H.5.11	Operation & Maintenance aspects-	
H.5.12	Global Best Practices in Bio Mass Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
H.5.13	<p>Commercial/ Regulatory Aspects:</p> <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Bio Mass Projects by Central &amp; State</li> </ul>	

	Governments. - Concept of Renewable Energy Certificates	
H.5.14	Concept of Power Trading and Power Exchange	
H.5.15	Risk and Major challenges in development of Bio Mass Projects.	
H.5.16	Clean Development Mechanism (CDM) Concept	
H.5.17	Visit to Manufacturer's works/Project sites	
H.5.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.6</b>	<b>RENEWABLE ENERGY PROJECTS (WIND)</b>	
H.6.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.6.2	Power Plant Familiarization	
H.6.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.6.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.6.5	Manufacturing trends in Wind Turbines and leading manufacturers of Wind Turbines, Major Wind projects in India.	
H.6.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.6.7	Design Aspects of a Wind Power Project.	
H.6.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.6.9	Quality Assurance and Inspection related issues	
H.6.10	Erection, Commissioning & Testing Aspects	

H.6.11	Operation & Maintenance aspects-	
H.6.12	Global Best Practices in Wind Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
H.6.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Wind Projects by Central and State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>	
H.6.14	Concept of Power Trading and Power Exchange	
H.6.15	Risk and Major challenges in development of Wind Power Projects.	
H.6.16	Clean Development Mechanism (CDM) Concept	
H.6.17	Visit to Manufacturer's works / Project sites	
H.6.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.7</b>	<b>RENEWABLE ENERGY PROJECTS (SMALL HYDRO)</b>	
H.7.1.	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.7.2.	Power Plant Familiarization	
H.7.3.	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
H.7.4.	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.7.5.	Manufacturing trends in Small Hydro Projects and leading manufacturer of Small Hydro Project Equipments, Major Small Hydro projects in India.	
H.7.6.	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> </ul>	

	<ul style="list-style-type: none"> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.7.7.	Design Aspects of a Small Hydro Power Project.	
H.7.8.	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
H.7.9.	Quality Assurance and Inspection related issues	
H.7.10	Erection, Commissioning & Testing Aspects	
H.7.11	Operation & Maintenance aspects-	
H.7.12	Global Best Practices in Small Hydro Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
H.7.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Small Hydro Projects by Central and State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>	
H.7.14	Concept of Power Trading and Power Exchange	
H.7.15	Risk and Major challenges in development of Small Hydro Power Projects.	
H.7.16	Clean Development Mechanism (CDM) Concept	
H.7.17	Visit to Manufacturer's works/Project sites	
H.7.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.8</b>	<b>ADVANCED POWER GENERATION TECHNOLOGIES</b>	
H.8.1.	Super Critical Technologies	
H.8.2.	Futuristic Technologies	
H.8.3.	Fluidized Bed Technology	
H.8.4.	Energy Storage	

H.8.5.	Recent Trends in Power Generation	
H.8.6.	Integrated Gasification Combined Cycle ( IGCC)	
H.8.7.	Distributed Generation	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.9</b>	<b>POWER TRANSMISSION AND SUB STATION SYSTEM</b>	
H.9.1.	Overview of Power Scenario in India (Growth of Power Sector and Transmission since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
H.9.2.	Over view of Transmission system and Sub Station System	
H.9.3.	DPR Preparation including Environmental Impact Assessment, Route selection Site Selection, Sub Station Layout Layout etc.	
H.9.4.	Transmission Line Survey techniques based on GIS and Satellite Imagery system	
H.9.5.	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.9.6.	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.9.7.	Design Aspects of a Transmission System and Sub Station System –Civil Aspects	
H.9.8.	Design Aspects of a Transmission System and Sub Station System –Mechanical and Electrical Aspects	
H.9.9.	Design Aspects of a Sub Station –Control and Instrumentation Aspects	
H.9.10.	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.	

H.9.11.	Quality Assurance and Inspection related issues	
H.9.12.	Erection, Commissioning & Testing – Civil Aspects	
H.9.13.	Erection, Commissioning & Testing – Mechanical and Electrical Aspects	
H.9.14.	Erection, Commissioning & Testing – Control and Instrumentation Aspects	
H.9.15.	Operation & Maintenance aspects of Transmission line and Sub Station	
H.9.16.	Power System Simulator	
H.9.17.	Global Best Practices in Transmission and Sub Station in the Area of Design, Construction, Operation and Maintenance, R & D Initiatives	
H.9.18.	Private Sector Participation in Transmission	
H.9.19.	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- Open Access</li> </ul>	
H.9.20.	Concept of Power Trading and Power Exchange	
H.9.21.	Transmission System and Sub Station System	
H.9.22.	HVDC transmission System	
H.9.23.	FACTS, SVC and Reactive Power Management	
H.9.24.	SCADA system	
H.9.25.	SMART Grid	
H.9.26.	Hot Line Transmission Maintenance and Insulator Washing System	
H.9.27.	Emergency restoration System	
H.9.28.	Gas Insulated Sub Stations (GIS)	
H.9.29.	Safety Aspects	
H.9.30.	Visit to Manufacturer's works/Project sites	
H.9.31.	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.10</b>	<b>DISTRIBUTION SYSTEM</b>	
H.10.1.	Overview of Power Scenario in India (Growth of Power Sector and Transmission and Distribution since Independence, Role of Ministry of Power, CPSUs, State Undertakings, DISCO's, Private Companies, Role of SERCs, Trading and Power Exchanges etc).	
H.10.2.	DPR Preparation Methodology	
H.10.3.	Distribution Line Survey techniques	
H.10.4.	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
H.10.5.	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
H.10.6.	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) – Civil Aspects	
H.10.7.	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) – Mechanical and Electrical Aspects	
H.10.8.	Design Aspects of a Sub Station – Control and Instrumentation Aspects	
H.10.9.	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.	
H.10.10.	Quality Assurance and Inspection related issues	
H.10.11.	Erection, Commissioning & Testing – Civil Aspects	
H.10.12.	Erection, Commissioning & Testing – Mechanical and Electrical Aspects	
H.10.13.	Erection, Commissioning & Testing – Control and Instrumentation Aspects	
H.10.14.	Operation & Maintenance aspects of Distribution line and Sub Station	

H.10.15.	SCADA System	
H.10.16.	Global Best Practices in Distribution and Sub Station in the Area of Design, Construction, Operation and Maintenance, R & D Initiatives, AT&C Loss Reduction techniques.	
H.10.17.	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- SERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- ARR Calculation</li> <li>- Open Access</li> </ul>	
H.10.18.	Concept of Power Trading and Power Exchange	
H.10.19.	Reactive Power Management	
H.10.20.	SMART Grid	
H.10.21.	Hot Line Transmission Maintenance and Insulator Washing System	
H.10.22.	Gas Insulated Sub Stations (GIS)	
H.10.23.	R-APDRP Scheme	
H.10.24.	RGGVY	
H.10.25.	Private Sector Participation in Distribution	
H.10.26.	Safety Aspects	
H.10.27.	Visit to Manufacturer's works / Project sites	
H.10.28.	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.11</b>	<b>POWER SYSTEM OPERATION</b> (Faculty shall prepare study material, and model question paper / question bank.)	
H.11.1.	Power Sector overview-India – 3hrs Electricity Supply chain, components of the Power System, Sources of Power: Hydro, Thermal, Nuclear, Gas, Renewable. Distribution of energy sources in the country, Institutional frame work, Regional grids in India, development of state, regional and national grids. Load	

	Dispatch function, Load Dispatch Centers in India, Control Areas: regional and state power systems, Inter connections, characteristics	
H.11.2.	Power Sector overview-International – 3hrs System Operation – International Practices: PJM, USA, NGC, UK, Nord Pool, ETSO, NEMMCO, Australia	
H.11.3.	Policy, Legislation – 6hrs Legal Framework, policies & regulations: Electricity Act 2003 (organizational set up in India, National Electricity Policy, Tariff Policy, Grid connectivity standards, Grid Standards Regulations, Metering Regulations	
H.11.4.	Regulations – 12 hrs Regulatory Framework ERC Regulations and Comparative study of Regulations of Central and State ERCs: Indian Electricity Grid Code (IEGC), Open Access Regulations, Terms and conditions of Tariff, unscheduled interchange regulations, congestion charge regulations, other regulations, activities of forum of regulators	
H.11.5.	Power System Operation –18 hrs Characteristics of Thermal, Hydro, Gas, Nuclear, renewable power plants. Overview of Generators, components, basic operating principles, rotational speed. Substations: Layout, Equipment, Bus arrangements. Circuit Breakers: Types, construction, operation, selection and sizing, Transformers: Physical construction cooling arrangements, Tap changers, auto transformers The effect of transmission line conductor resistance and inductance, line voltage drop and power angle, effect of line loading on voltage drop and power angle, effect of load power factor on voltage drop and power angle The need to generate and provide MVAR, sources and sinks of reactive power, charging current required due to the line shunt capacitance, production of reactive power by line shunt capacitance, Ferranti effect. Line reactive compensation equipment: Reactors, capacitors, Synchronous Condensers and Static VAR compensators Power Quality: Voltage flicker, Voltage swells, Sags, Unbalance; Measurement, Power System Harmonics and mitigation Over view of power system protection, Protection Zones, classification of protection relays, Impedance protection and fault loops, impedance relay characteristics, reactance, impedance, admittance (MHO), quadrilateral, special characteristics, faults affecting impedance relay performance, fault resistance, load encroachment, remote in feed, mutual induction, System protection schemes,	

	Protection for abnormal frequency and voltages,	
H.11.6.	<p>Electricity Market Operation – 12 hrs Fundamentals of Electricity markets: Restructuring, Corporatization, privatization, competitive markets – pricing mechanisms, regulated markets, impact of transmission and system operation on electricity markets</p> <p>Whole Sale market design: Bilateral contracts, organized trading, market abuse and its mitigation: Market power and its evaluation, implications of market abuse, detection and avoidance of market abuse</p> <p>Metering and settlement: Measurement principles, meter placement, meter data collection, validation and processing, preparation of energy accounts billing, regional energy account, unscheduled interchange account, reactive energy account, congestion rent.</p> <p>Day – ahead resource scheduling: load forecasting, preparation of daily schedules, shortages, base load stations, peaking stations, must – run stations, generation location &amp; effect on losses, open access: Bilateral contracts and power exchange transactions.</p> <p>Commercial &amp; Economic Aspects: Introduction to Power System Economics, Electricity Markets, Pool Operation Co-ordinated multilateral trading model, power exchanges, capacity &amp; energy markets, balancing mechanism, ancillary services market</p> <p>Settlement system – ABT &amp; UI, modalities for access to transmission: Long term, Medium term, Short term</p>	
H.11.7.	<p>System Logistics (SCADA/IT) – 6hrs</p> <p>SCADA / EMS: Overview, architecture, main components, Hardware-overview, System software – Displays, Database; Disturbance data collection modules / HDR retrieval &amp; playback, HIM, Trends, Alarms, Health check, trouble shooting</p> <p>Communication systems: Overview – VSAT, Microwave, Optical fiber etc., hardware protocols, Configuration, Communication network</p> <p>Information Technology tools: MS word, MS Excel, MS Power Point, MS Access, MS Outlook, E-mail, use of Internet</p>	

H.11.8.	<p>Energy Management System – 6hrsEnergy Management System: Load forecasting- similar day forecast, weather based load forecast, historical data, Network study- Network modeling; special devices like HVDC, FSC, Pumped storage; network reduction &amp; equivalence, state estimation – techniques, detection &amp; identification of bad measurement, network observability, Optimal power flow-cost optimization, loss optimization, control optimization, voltage &amp; VAR scheduling, unit commitment, contingency analysis</p> <p>Power system reliability: Adequacy – Long term planning, procurement security, states of power system – normal, alert, emergency, restorative, planning criteria, connectivity standards, grid standards, grid code, power system equipment capacity &amp; limits, Transmission capacity &amp; transfer capability, ATC in planning and operating time frames, Requirement of reliability co-ordinators at organizational level</p>	
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Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.12</b>	<b>ENERGY CONSERVATION AND ENERGY AUDIT</b>	
H.12.1.	Energy Conservation Act 2001	
H.12.2.	Identifying basic potential of conservation of Energy	
H.12.3.	Thermal Energy System	
H.12.4.	Electrical Energy System	
H.12.5.	Energy Balancing	
H.12.6.	Energy Management	
H.12.7.	Energy Audit	
H.12.8.	Audit for Buildings & Commercial Complexes	
H.12.9.	Industrial Energy Audit	
H.12.10.	Methodologies for Energy audit	
H.12.11.	Energy Audit for Generation, Transmission and Distribution Utilities	
H.12.12.	Incentives for Energy Conservation	
H.12.13.	Energy Efficient Equipment and Technologies	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.13</b>	<b>ENVIRONMENT MANAGEMENT AND POLLUTION CONTROL</b>	
H.13.1.	Energy and Ecology	
H.13.2.	Legislation & standards for Noise, Air and Water Pollution	
H.13.3.	Environmental Protection Act (EPA)-1986	
H.13.4.	Water pollution.	
H.13.5.	Air Pollution caused by coal & oil	
H.13.6.	Demonstration of Air quality monitor	
H.13.7.	Disease caused due to thermal power plant pollution and other impact.	
H.13.8.	Environnemental Impact Asses ment	
H.13.9.	Environnemental Audit.	
H.13.10.	Environnemental Issues in Power Sector	
H.13.11.	Visit to Manufacturer's works/Project sites	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.14</b>	<b>GENERAL MANAGEMENT</b>	
H.14.1.	Finance for non Finance Exécutives	
H.14.2.	HR management	
H.14.3.	Finance Management	
H.14.4.	Materials Management	
H.14.5.	Procurent Procédures	
H.14.6.	Procurement Under World Bank guidelines	
H.14.7.	E-Procurement	
H.14.8.	Project Financing	
H.14.9.	Power Trading Exchanges and Open Access	
H.14.10.	Legal Aspects in Contract Management	
H.14.11.	Accountancy	
H.14.12.	Managerial Economics	

H.14.13.	Operation Management	
H.14.14.	Management Information system	
H.14.15.	Business Communication Skills	
H.14.16.	Power Plant Familiarization for Technical Personnel (Thermal , Hydel and Gas)	
H.14.17.	Power Plant Familiarization for Non Technical personnel (Thermal , Hydel and Gas)	
H.14.18.	Familiarization with Transmission and Distribution System for Non Technical personnel	
H.14.19.	Delegation of Powers	
H.14.20.	Disciplinary and Vigilance Procedures	
H.14.21.	Corporate Social Responsibility	
H.14.22.	Reservation Policy	
H.14.23.	Seven Habits of Highly Effective people	
H.14.24.	Training of Trainers in Communication Skills	
H.14.25.	Leadership Skills	
H.14.26.	How to enhance productivity in an Organization	
H.14.27.	ERP	
H.14.28.	Communication skills and public speaking	
H.14.29.	Clean Development Mechanism (CDM) Concept	
H.14.30.	Geographical Information System (GIS) applications	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>H.15</b>	<b>COMPUTER RELATED COURSES</b>	
H.15.1.	Microsoft Word	
H.15.2.	Microsoft Excel	
H.15.3.	Microsoft Power Point	
H.15.4.	Photo Shop	
H.15.5.	Note pad	
H.15.6.	Word Pad	
H.15.7.	SMART draw	
H.15.8.	Auto CAD	
H.15.9.	Coral Draw	
H.15.10.	Primavera	
H.15.11.	MS Project	
H.15.12.	MS Access	
H.15.13.	Computer Hardware	
H.15.14.	Computer Networking (LAN / WAN etc.)	

(I) **Faculty / Consultants / Authors for review of study materials / manuals :**

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.1</b>	<b>THERMAL POWER PLANT ENGINEERING</b>	
I.1.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.1.2	Power Plant Familiarization	
I.1.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.1.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.1.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.1.6	Design Aspects of a Power Plant -Civil Aspects	
I.1.7	Design Aspects of a Power Plant -Mechanical Aspects	
I.1.8	Design Aspects of a Power Plant -Electrical Aspects	
I.1.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
I.1.10	Power Plant Chemistry	
I.1.11	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.1.12	Quality Assurance and Inspection related issues	
I.1.13	Erection, Commissioning & Testing - Civil Aspects	
I.1.14	Erection, Commissioning & Testing - Mechanical Aspects	
I.1.15	Erection, Commissioning & Testing - Electrical Aspects	

I.1.16	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
I.1.17	Operation & Maintenance aspects- Mechanical Equipment (Boiler)	
I.1.18	Operation & Maintenance aspects- Mechanical Equipment (Turbine)	
I.1.19	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
I.1.20	Operation & Maintenance aspects- Electrical Equipments	
I.1.21	Operation & Maintenance aspects- Control and Instrumentation Equipments	
I.1.22	Energy Efficiency in Thermal Power Station	
I.1.23	Thermal Power Plant Simulator	
I.1.24	Global Best Practices in Thermal Engineering in the Area of Design, Construction, Operation and Maintenance	
I.1.25	Super Critical Technology- Salient Aspects	
I.1.26	Clean Development Mechanism (CDM) Concept	
I.1.27	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
I.1.28	Concept of Power Trading and Power Exchange	
I.1.29	Implementation of UMPPs	
I.1.30	Private Sector Participation in Generation	
I.1.31	Tariff Based Bidding(Case-I and Case-II)	
I.1.32	Overview of Coal Requirements for Power Projects	
I.1.33	Safety Aspects	
I.1.34	Lectures on Various labs and Conducting Practical's in the Labs- Electrical Lab	
I.1.35	Visit to Manufacturer's works/Project sites	
I.1.36	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	
I.1.37	Setting of Question Papers and Evaluation of Answer sheets – Civil Engineering Aspects	
I.1.38	Setting of Question Papers and Evaluation of Answer sheets – Mechanical Engineering Aspects	
I.1.39	Setting of Question Papers and Evaluation of Answer sheets – Electrical Engineering Aspects	
I.1.40	Setting of Question Papers and Evaluation of Answer sheets – Control and Instrumentation Engineering Aspects	

I.1.41	Obtaining Feedback of Trainees, Analysis of Feedback and preparation of MIS Report for top management	
	<b>PRACTICALS</b>	
I.1.42	Control and Instrumentation Lab	
I.1.43	Computer Lab	
I.1.44	Geographical Information System (GIS) Lab	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
I.2	<b>HYDRO POWER PLANT ENGINEERING</b>	
I.2.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.2.2	Power Plant Familiarization (Types of Dams etc)	
I.2.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.2.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.2.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.2.6	Design Aspects of a Power Plant -Civil Aspects	
I.2.7	Design Aspects of a Power Plant -Mechanical Aspects	
I.2.8	Design Aspects of a Power Plant -Electrical Aspects	
I.2.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
I.2.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.2.11	Quality Assurance and Inspection related issues	

I.2.12	Erection, Commissioning & Testing - Civil Aspects	
I.2.13	Erection, Commissioning & Testing - Mechanical Aspects	
I.2.14	Erection, Commissioning & Testing - Electrical Aspects	
I.2.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
I.2.16	Operation & Maintenance aspects- Mechanical Equipment (Turbine)	
I.2.17	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
I.2.18	Operation & Maintenance aspects- Electrical Equipments	
I.2.19	Operation & Maintenance aspects- Control and Instrumentation Equipments	
I.2.20	Energy Efficiency in Hydro Power Station	
I.2.21	Hydro Power Plant Simulator	
I.2.22	Global Best Practices in Hydro Engineering in the area of Design, Construction, Operation and Maintenance	
I.2.23	Private Sector Participation in Generation	
I.2.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- National Hydro Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
I.2.25	Concept of Power Trading and Power Exchange	
I.2.26	Clean Development Mechanism (CDM) Concept	
I.2.27	Lectures on Various labs and Conducting Practical's in the Labs- Silt Lab	
I.2.28	Lectures on Various labs and Conducting Practical's in the Labs- Hydro Lab	
I.2.29	Safety Aspects	
I.2.30	Visit to Manufacturer's works/Project sites	
I.2.31	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	
	<b>PRACTICALS</b>	
I.2.32	Hydro and Silt Lab	
I.2.33	Electrical Lab	
I.2.34	Digital Electronics and Communication Lab	
I.2.35	Control and Instrumentation Lab	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.3</b>	<b>COMBINED CYCLE GAS POWER GENERATION</b>	
I.3.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.3.2	Power Plant Familiarization	
I.3.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.3.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.3.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.3.6	Design Aspects of a Power Plant -Civil Aspects	
I.3.7	Design Aspects of a Power Plant -Mechanical Aspects	
I.3.8	Design Aspects of a Power Plant -Electrical Aspects	
I.3.9	Design Aspects of a Power Plant –Control and Instrumentation Aspects	
I.3.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.3.11	Quality Assurance and Inspection related issues	
I.3.12	Erection, Commissioning & Testing - Civil Aspects	
I.3.13	Erection, Commissioning & Testing - Mechanical Aspects	
I.3.14	Erection, Commissioning & Testing - Electrical Aspects	
I.3.15	Erection, Commissioning & Testing - Control and Instrumentation Aspects	
I.3.16	Operation & Maintenance aspects- Mechanical Equipment (Boiler)	
I.3.17	Operation & Maintenance aspects- Mechanical Equipment (Gas Turbine)	

I.3.18	Operation & Maintenance aspects- Mechanical Equipment (Balance of Plant Equipments)	
I.3.19	Operation & Maintenance aspects- Electrical Equipments	
I.3.20	Operation & Maintenance aspects- Control and Instrumentation Equipments	
I.3.21	Energy Efficiency in Gas Based Power Station	
I.3.22	Combined Cycle Gas Turbine Power Plant Simulator	
I.3.23	Global Best Practices in Gas based Power Projects in the Area of Design, Construction, Operation and Maintenance.	
I.3.24	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation, 2010.</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> </ul>	
I.3.25	Concept of Power Trading and Power Exchange	
I.3.26	Overview of Gas Requirements for Power Projects	
I.3.27	Clean Development Mechanism (CDM) Concept	
I.3.28	Safety Aspects	
I.3.29	Visit to Manufacturer's works / Project sites	
I.3.30	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.4</b>	<b>RENEWABLE ENERGY PROJECTS (SOLAR PHOTO VOLTAIC AND SOLAR THERMAL)</b>	
I.4.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	

I.4.2	Power Plant Familiarization	
I.4.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.4.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.4.5	Manufacturing trends in Solar PV industries and leading manufacturers of Solar Equipments, Major Solar projects in India.	
I.4.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.4.7	Design Aspects of a Power Plant – Solar Photo Voltaic and Solar Thermal	
I.4.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.4.9	Quality Assurance and Inspection related issues	
I.4.10	Erection, Commissioning & Testing Aspects	
I.4.11	Operation & Maintenance aspects-	
I.4.12	Global Best Practices in Solar Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
I.4.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Solar Projects by Central and State Governments.</li> </ul> <p>Concept of Renewable Energy Certificates</p>	
I.4.14	Concept of Power Trading and Power Exchange	
I.4.15	Jawaharlal Nehru National Solar Mission	
I.4.16	Risk and Major challenges in development of Solar Power.	
I.4.17	Clean Development Mechanism (CDM) Concept	
I.4.18	Visit to Manufacturer's works / Project sites	
I.4.19	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
I.5	<b>RENEWABLE ENERGY PROJECTS (BIO MASS / BIOGAS / COGENERATION)</b>	
I.5.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.5.2	Power Plant Familiarization	
I.5.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.5.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.5.5	Manufacturing trends in Bio Mass industries and leading manufacturer of Bio Mass Equipments, Major Bio Mass projects in India.	
I.5.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.5.7	Design Aspects of a Power Plant	
I.5.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.5.9	Quality Assurance and Inspection related issues	
I.5.10	Erection, Commissioning & Testing Aspects	
I.5.11	Operation & Maintenance aspects-	
I.5.12	Global Best Practices in Bio Mass Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
I.5.13	Commercial/ Regulatory Aspects:	

	<ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Bio Mass Projects by Central &amp; State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>	
I.5.14	Concept of Power Trading and Power Exchange	
I.5.15	Risk and Major challenges in development of Bio Mass Projects.	
I.5.16	Clean Development Mechanism (CDM) Concept	
I.5.17	Visit to Manufacturer's works/Project sites	
I.5.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.6</b>	<b>RENEWABLE ENERGY PROJECTS (WIND)</b>	
I.6.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.6.2	Power Plant Familiarization	
I.6.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
I.6.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.6.5	Manufacturing trends in Wind Turbines and leading manufacturers of Wind Turbines, Major Wind projects in India.	
I.6.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical</li> </ul>	

	Specifications, - Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,	
I.6.7	Design Aspects of a Wind Power Project.	
I.6.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
I.6.9	Quality Assurance and Inspection related issues	
I.6.10	Erection, Commissioning & Testing Aspects	
I.6.11	Operation & Maintenance aspects-	
I.6.12	Global Best Practices in Wind Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
I.6.13	Commercial/ Regulatory Aspects: - Indian Electricity Act. - National Electricity Policy - Indian Tariff Policy - CERC Terms and Conditions of Tariff Regulation. - Tariff Orders issued by various SERCs - Incentives for Wind Projects by Central and State Governments. - Concept of Renewable Energy Certificates	
I.6.14	Concept of Power Trading and Power Exchange	
I.6.15	Risk and Major challenges in development of Wind Power Projects.	
I.6.16	Clean Development Mechanism (CDM) Concept	
I.6.17	Visit to Manufacturer's works / Project sites	
I.6.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.7</b>	<b>RENEWABLE ENERGY PROJECTS (SMALL HYDRO)</b>	
I.7.1	Overview of Power Scenario in India (Growth of Power Sector since Independence, Role of Ministry of Power / MNRE, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power	

	Exchanges etc).	
1.7.2	Power Plant Familiarization	
1.7.3	DPR Preparation including Environmental Impact Assessment, Site Selection, Plant Layout etc.	
1.7.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
1.7.5	Manufacturing trends in Small Hydro Projects and leading manufacturer of Small Hydro Project Equipments, Major Small Hydro projects in India.	
1.7.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
1.7.7	Design Aspects of a Small Hydro Power Project.	
1.7.8	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Power Project.	
1.7.9	Quality Assurance and Inspection related issues	
1.7.10	Erection, Commissioning & Testing Aspects	
1.7.11	Operation & Maintenance aspects-	
1.7.12	Global Best Practices in Small Hydro Power Plant Engineering in the Area of Design, Construction, Operation and Maintenance	
1.7.13	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation.</li> <li>- Tariff Orders issued by various SERCs</li> <li>- Incentives for Small Hydro Projects by Central and State Governments.</li> <li>- Concept of Renewable Energy Certificates</li> </ul>	
1.7.14	Concept of Power Trading and Power Exchange	
1.7.15	Risk and Major challenges in development of Small Hydro Power Projects.	
1.7.16	Clean Development Mechanism (CDM) Concept	
1.7.17	Visit to Manufacturer's works / Project sites	
1.7.18	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.8</b>	<b>ADVANCED POWER GENERATION TECHNOLOGIES</b>	
I.8.1	Super Critical Technologies	
I.8.2	Futuristic Technologies	
I.8.3	Fluidized Bed Technology	
I.8.4	Energy Storage	
I.8.5	Recent Trends in Power Generation	
I.8.6	Integrated Gasification Combined Cycle ( IGCC)	
I.8.7	Distributed Generation	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.9</b>	<b>POWER TRANSMISSION AND SUB STATION SYSTEM</b>	
I.9.1	Overview of Power Scenario in India (Growth of Power Sector and Transmission since Independence, Role of Ministry of Power, CPSUs, State Undertakings, IPPs, major projects in India, Role of CERC and SERCs, Trading and Power Exchanges etc).	
I.9.2	Over view of Transmission system and Sub Station System	
I.9.3	DPR Preparation including Environmental Impact Assessment, Route selection Site Selection, Sub Station Layout etc.	
I.9.4	Transmission Line Survey techniques based on GIS and Satellite Imagery system	
I.9.5	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.9.6	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> </ul>	

	<ul style="list-style-type: none"> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.9.7	Design Aspects of a Transmission System and Sub Station System –Civil Aspects	
I.9.8	Design Aspects of a Transmission System and Sub Station System –Mechanical and Electrical Aspects	
I.9.9	Design Aspects of a Sub Station –Control and Instrumentation Aspects	
I.9.10	Procurement Methodology, Contracting Procedure, Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.	
I.9.11	Quality Assurance and Inspection related issues	
I.9.12	Erection, Commissioning & Testing – Civil Aspects	
I.9.13	Erection, Commissioning & Testing – Mechanical and Electrical Aspects	
I.9.14	Erection, Commissioning & Testing – Control and Instrumentation Aspects	
I.9.15	Operation & Maintenance aspects of Transmission line and Sub Station	
I.9.16	Power System Simulator	
I.9.17	Global Best Practices in Transmission and Sub Station in the Area of Design, Construction, Operation and Maintenance, R & D Initiatives	
I.9.18	Private Sector Participation in Transmission	
I.9.19	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- CERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- Open Access</li> </ul>	
I.9.20	Concept of Power Trading and Power Exchange	
I.9.21	Transmission System and Sub Station System	
I.9.22	HVDC transmission System	
I.9.23	FACTS, SVC and Reactive Power Management	
I.9.24	SCADA system	
I.9.25	SMART Grid	
I.9.26	Hot Line Transmission Maintenance and Insulator Washing System	

I.9.27	Emergency restoration System	
I.9.28	Gas Insulated Sub Stations (GIS)	
I.9.29	Safety Aspects	
I.9.30	Visit to Manufacturer's works / Project sites	
I.9.31	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.10</b>	<b>DISTRIBUTION SYSTEM</b>	
I.10.1	Overview of Power Scenario in India (Growth of Power Sector and Transmission and Distribution since Independence, Role of Ministry of Power, CPSUs, State Undertakings, DISCO's, Private Companies, Role of SERCs, Trading and Power Exchanges etc).	
I.10.2	DPR Preparation Methodology	
I.10.3	Distribution Line Survey techniques	
I.10.4	Methodology of Project Appraisal and Sanction of Loans by Lenders.	
I.10.5	Methodology of Project Implementation: <ul style="list-style-type: none"> <li>- Appointment of Design Consultant</li> <li>- Appointment of Bid Process Consultant</li> <li>- Appointment of Project Management Consultant</li> <li>- Preparation of Bid Packages</li> <li>- Design of Plant and Preparation of Detail Technical Specifications,</li> <li>- Preparation of Bid Documents inter-alia consisting of conditions of contract, Bid Proposal Sheets Etc.,</li> </ul>	
I.10.6	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) –Civil Aspects	
I.10.7	Design Aspects of a Distribution System (Distribution Lines and Sub Station System) –Mechanical and Electrical Aspects	
I.10.8	Design Aspects of a Sub Station –Control and Instrumentation Aspects	
I.10.9	Procurement Methodology, Contracting Procedure,	

	Conditions of Contract and Evaluation methodology for implementation of the Transmission and Sub Station Project.	
I.10.10	Quality Assurance and Inspection related issues	
I.10.11	Erection, Commissioning & Testing – Civil Aspects	
I.10.12	Erection, Commissioning & Testing – Mechanical and Electrical Aspects	
I.10.13	Erection, Commissioning & Testing – Control and Instrumentation Aspects	
I.10.14	Operation & Maintenance aspects of Distribution line and Sub Station	
I.10.15	SCADA System	
I.10.16	Global Best Practices in Distribution and Sub Station in the Area of Design, Construction, Operation and Maintenance, R & D Initiatives, AT&C Loss Reduction techniques.	
I.10.17	Commercial/ Regulatory Aspects: <ul style="list-style-type: none"> <li>- Indian Electricity Act.</li> <li>- National Electricity Policy</li> <li>- Indian Tariff Policy</li> <li>- SERC Terms and Conditions of Tariff Regulation,</li> <li>- ABT and UI Concept</li> <li>- Multi Year Tariffs</li> <li>- ARR Calculation</li> <li>- Open Access</li> </ul>	
I.10.18	Concept of Power Trading and Power Exchange	
I.10.19	Reactive Power Management	
I.10.20	SMART Grid	
I.10.21	Hot Line Transmission Maintenance and Insulator Washing System	
I.10.22	Gas Insulated Sub Stations (GIS)	
I.10.23	R-APDRP Scheme	
I.10.24	RGGVY	
I.10.25	Private Sector Participation in Distribution	
I.10.26	Safety Aspects	
I.10.27	Visit to Manufacturer's works/Project sites	
I.10.28	On the Job Training (The work will Involve taking trainees to various organizations and coordinate On the Job Training)	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
I.11	<b>POWER SYSTEM OPERATION</b> (Faculty shall review study material and model question paper / question bank.)	
I.11.1	Power Sector overview-India – 3hrs Electricity Supply chain, components of the Power System, Sources of Power: Hydro, Thermal, Nuclear, Gas, Renewable. Distribution of energy sources in the country, Institutional frame work, Regional grids in India, development of state, regional and national grids. Load Dispatch function, Load Dispatch Centers in India, Control Areas: regional and state power systems, Inter connections, characteristics	
I.11.2	Power Sector overview-International – 3hrs System Operation – International Practices: PJM, USA, NGC, UK, Nord Pool, ETSO, NEMMCO, Australia	
I.11.3	Policy, Legislation – 6hrs Legal Framework, policies & regulations: Electricity Act 2003 (organizational set up in India, National Electricity Policy, Tariff Policy, Grid connectivity standards, Grid Standards Regulations, Metering Regulations	
I.11.4	Regulations – 12 hrs Regulatory Framework ERC Regulations and Comparative study of Regulations of Central and State ERCs: Indian Electricity Grid Code (IEGC), Open Access Regulations, Terms and conditions of Tariff, unscheduled interchange regulations, congestion charge regulations, other regulations, activities of forum of regulators	
I.11.5	Power System Operation –18 hrs Characteristics of Thermal, Hydro, Gas, Nuclear, renewable power plants. Overview of Generators, components, basic operating principles, rotational speed. Substations: Layout, Equipment, Bus arrangements. Circuit Breakers: Types, construction, operation, selection and sizing, Transformers: Physical construction cooling arrangements, Tap changers, auto transformers The effect of transmission line conductor resistance and inductance, line voltage drop and power angle, effect of line	

	<p>loading on voltage drop and power angle, effect of load power factor on voltage drop and power angle</p> <p>The need to generate and provide MVAR, sources and sinks of reactive power, charging current required due to the line shunt capacitance, production of reactive power by line shunt capacitance, Ferranti effect. Line reactive compensation equipment: Reactors, capacitors, Synchronous Condensers and Static VAR compensators</p> <p>Power Quality: Voltage flicker, Voltage swells, Sags, Unbalance; Measurement, Power System Harmonics and mitigation</p> <p>Over view of power system protection, Protection Zones, classification of protection relays, Impedance protection and fault loops, impedance relay characteristics, reactance, impedance, admittance (MHO), quadrilateral, special characteristics, faults affecting impedance relay performance, fault resistance, load encroachment, remote in feed, mutual induction, System protection schemes, Protection for abnormal frequency and voltages,</p>	
I.11.6	<p>Electricity Market Operation – 12 hrs Fundamentals of Electricity markets: Restructuring, Corporatization, privatization, competitive markets – pricing mechanisms, regulated markets, impact of transmission and system operation on electricity markets</p> <p>Whole Sale market design: Bilateral contracts, organized trading, market abuse and its mitigation: Market power and its evaluation, implications of market abuse, detection and avoidance of market abuse</p> <p>Metering and settlement: Measurement principles, meter placement, meter data collection, validation and processing, preparation of energy accounts billing, regional energy account, unscheduled interchange account, reactive energy account, congestion rent.</p> <p>Day – ahead resource scheduling: load forecasting, preparation of daily schedules, shortages, base load stations, peaking stations, must – run stations, generation location &amp; effect on losses, open access: Bilateral contracts and power exchange transactions.</p> <p>Commercial &amp; Economic Aspects: Introduction to Power System Economics, Electricity Markets, Pool Operation Co-ordinated multilateral trading model, power exchanges,</p>	

	<p>capacity &amp; energy markets, balancing mechanism, ancillary services market</p> <p>Settlement system – ABT &amp; UI, modalities for access to transmission: Long term, Medium term, Short term</p>	
I.11.7	<p>System Logistics (SCADA/IT) – 6hrs  SCADA / EMS: Overview, architecture, main components, Hardware-overview, System software – Displays, Database; Disturbance data collection modules / HDR retrieval &amp; playback, HIM, Trends, Alarms, Health check, trouble shooting</p> <p>Communication systems: Overview – VSAT, Microwave, Optical fiber etc., hardware protocols, Configuration, Communication network</p> <p>Information Technology tools: MS word, MS Excel, MS Power Point, MS Access, MS Outlook, E-mail, use of Internet</p>	
I.11.8	<p>Energy Management System – 6hrs  Energy Management System: Load forecasting- similar day forecast, weather based load forecast, historical data, Network study- Network modeling; special devices like HVDC, FSC, Pumped storage; network reduction &amp; equivalence, state estimation – techniques, detection &amp; identification of bad measurement, network observability, Optimal power flow-cost optimization, loss optimization, control optimization, voltage &amp; VAR scheduling, unit commitment, contingency analysis</p> <p>Power system reliability: Adequacy – Long term planning, procurement security, states of power system – normal, alert, emergency, restorative, planning criteria, connectivity standards, grid standards, grid code, power system equipment capacity &amp; limits, Transmission capacity &amp; transfer capability, ATC in planning and operating time frames, Requirement of reliability co-ordinators at organizational level</p>	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.12</b>	<b>ENERGY CONSERVATION AND ENERGY AUDIT</b>	
I.12.1	Energy Conservation Act 2001	
I.12.2	Identifying basic potential of conservation of Energy	
I.12.3	Thermal Energy System	
I.12.4	Electrical Energy System	
I.12.5	Energy Balancing	
I.12.6	Energy Management	
I.12.7	Energy Audit	
I.12.8	Audit for Buildings & Commercial Complexes	
I.12.9	Industrial Energy Audit	
I.12.10	Methodologies for Energy audit	
I.12.11	Energy Audit for Generation, Transmission and Distribution Utilities	
I.12.12	Incentives for Energy Conservation	
I.12.13	Energy Efficient Equipment and Technologies	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.13</b>	<b>ENVIRONMENT MANAGEMENT AND POLLUTION CONTROL</b>	
I.13.1	Energy and Ecology	
I.13.2	Legislation & standards for Noise, Air and Water Pollution	
I.13.3	Environmental Protection Act (EPA)-1986	
I.13.4	Water pollution.	
I.13.5	Air Pollution caused by coal & oil	
I.13.6	Demonstration of Air quality monitor	
I.13.7	Disease caused due to thermal power plant pollution and other impact.	
I.13.8	Environmental Impact Assessment	

I.13.9	Environnemental Audit.	
I.13.10	Environnemental Issues in Power Sector	
I.13.11	Visit to Manufacturer's works / Project sites	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.14</b>	<b>GENERAL MANAGEMENT</b>	
I.14.1	Finance for non Finance Exécutives	
I.14.2	HR management	
I.14.3	Finance Management	
I.14.4	Materials Management	
I.14.5	Procurement Procédures	
I.14.6	Procurement Under World Bank guidelines	
I.14.7	E-Procurement	
I.14.8	Project Financing	
I.14.9	Power Trading Exchanges and Open Access	
I.14.10	Legal Aspects in Contract Management	
I.14.11	Accountancy	
I.14.12	Managerial Economics	
I.14.13	Operation Management	
I.14.14	Management Information system	
I.14.15	Business Communication Skills	
I.14.16	Power Plant Familiarization for Technical Personnel (Thermal , Hydel and Gas)	
I.14.17	Power Plant Familiarization for Non Technical personnel (Thermal , Hydel and Gas)	
I.14.18	Familiarization with Transmission and Distribution System for Non Technical personnel	
I.14.19	Delegation of Powers	
I.14.20	Disciplinary and Vigilance Procedures	
I.14.21	Corporate Social Responsibility	
I.14.22	Reservation Policy	
I.14.23	Seven Habits of Highly Effective people	
I.14.24	Training of Trainers in Communication Skills	
I.14.25	Leadership Skills	
I.14.26	How to enhance productivity in an Organization	
I.14.27	ERP	
I.14.28	Communication skills and public speaking	
I.14.29	Clean Development Mechanism (CDM) Concept	
I.14.30	Geographical Information System (GIS) applications	

Subject Code	NAME OF THE SUBJECT / COURSE	Coordination at Faridabad
<b>I.15</b>	<b>COMPUTER RELATED COURSES</b>	
I.15.1	Microsoft Word	
I.15.2	Microsoft Excel	
I.15.3	Microsoft Power Point	
I.15.4	Photo Shop	
I.15.5	Note pad	
I.15.6	Word Pad	
I.15.7	SMART draw	
I.15.8	Auto CAD	
I.15.9	Coral Draw	
I.15.10	Primavera	
I.15.11	MS Project	
I.15.12	MS Access	
I.15.13	Computer Hardware	
I.15.14	Computer Networking (LAN / WAN etc.)	

**(J) NPTI Monitors for monitoring the performance of above activities or any of the existing activities of NPTI.**

(Coordination will be done by corporate office Faridabad).

The Monitors shall monitor the various activities as listed above or any of the existing activities of NPTI. Their job shall include travel to various locations for which TA/DA shall be paid by NPTI. They shall regularly submit progress report and exception report to the top management of NPTI.

<b>S. No</b>	<b>Description</b>	Coordination will be done by Corporate office, Faridabad
<b>J.1</b>	<b>Monitors</b>	

**(K) Full time / Part time consultants to assist in the following activities of NPTI, at Corporate office, Faridabad.**

<b>S. No</b>	<b>Description</b>	Coordination will be done by Corporate office, Faridabad
K.1	<b>Consultants Full time / Part time</b>	
K.1.1	General Coordination work related to various courses being conducted by NPTI.	
K.1.2	HR (HRM and HRD) related work.	
K.1.3	Law related work like rendering advice on service matters, contract agreements, disputes, arbitration, court cases, CAT cases etc.	
K.1.4	Preparation of computer based training (CBT) programs, web based training programs etc.	
K.1.5	Technical consultants (Electrical)	
K.1.6	Technical consultants (Mechanical)	
K.1.7	Technical consultants (C&I)	
K.1.8	Technical consultants (IT / Computers / Website designing)	
K.1.9	Technical consultants (Civil)	
K.1.10	Finance and Accounts	
K.1.11	Procurement	
K.1.12	Corporate communication / PR related work / Publication of in house News letter etc.	