**Course Profile**

**Semester: Summer**

**Year: 2020**

**Level/Term:**

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| --- | --- | --- | --- |
| **I. Course Code:** | EEE 449 | | |
| **II. Course Title:** | Power Plant Engineering | | |
| **III. Credit:** | 3 | **IV. Pre-Requisite:** | Courses upto L4T1 |
| **V. Contact Hours:** | Lecture- 3 hours/week | | |
| **VI. Course Objectives:** | | | |
| **Aims and Objective:**   * To introduce primary energy sources for power generation. * To provide overview of global and Bangladesh power generation * To provide general concepts of conventional and non-conventional power generation plants. * To familiarize with important terms and factors associated with power plant economics. * To introduce different power plants and their power generation principles.   **Course Key Objective**  To develop the concept of primary energy sources, electricity generation, performance and characteristics of different power generation plants, and economics of power generation. | | | |

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| **VII. Course Outcome (COs):** | | | | | | | |
| **Sl. No.** | **Cos**  (Upon successful completion of this course, students should be able to) | **Corresponding POs** | **Bloom’s taxonomy domain/level\*** | | | **Delivery Methods & activities** | **Assessment tools** |
| C | A | P |
| CO 449-1 | **Demonstrate** the concepts and phenomenon of different power generation | PO1 | 2 | - | - | Lectures,  Tutorials | CT, Exam |
| CO 449-2 | **Analyze** power sharing amongst units for economic allocation | PO2 | 4 | - | - | Lectures,  Tutorials | CT, Exam,  Assignments |
| CO 449-3 | **Design & organize** different types of power plant | PO3,PO7,  PO8 | 6 | - | - | Lectures,  Tutorials | CT, Exam,  Project |
| CO 449-4 | **Analyze** different types of nonconventional energy resources | PO4 | 3 |  |  | Lectures | CT, Exam |

\* C: Cognitive, P: Psychomotor; A: Affective

**VIII. Course Plan with Detail Description:**

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| --- | --- | --- |
| **Session** | **Contents** | **Cos** |
| **Week 1** | * Introduction to the course * Various energy sources, concepts and phenomenon of power generation | 1 |
| **Week 2** | * Power station performance: connected load, demand factor, diversity factor, load factor, plant factor, utilization factor * Details about base load and peak load power plants * Economic Load Sharing between different types of power plants * Related Mathematical problems | 2,3 |
| **Week 3** | * Plant performance and operating characteristics: incremental rate, heat rate, efficiency * Economic Load Sharing between different units of a power plant * Condition of maximum efficiency of a power plant | 2,3 |
| **Week 4** | * Station performance characteristics * capacity scheduling, choice of power station and units | 1, 2,3 |
| **Week 5** | * Interconnected System: Capacity savings * Power sharing amongst units for economic allocation | 2, 3 |
| **Week 6** | * Thermal power stations: equipment * Thermal plant operation | 2, 3 |
| **Week 7** | * Energy Tariff: description, types and tariff in Bangladesh * Tariff related problems * Depreciation: types, derivation and related problems | 2, 3,4 |
| **Week 8** | * Hydro power stations: plant auxiliaries, plant operation * Related Mathematical problems | 1,3 |
| **Week 9** | * Nuclear power stations: Definition * Chain reactions, Nuclear Fission and Fusion * Energy Conversion * Radioactive decay * Binding Energy, Reactor types * Layout of nuclear power plant | 1,3 |
| **Week 10** | * Nuclear power plant Equipment * Nuclear reactor and its types * Moderator and moderating ratio, Reflector, Biological shielding * Classification of coolant cycles * Methods of waste disposal * Review of lectures delivered so far and discussion with the students | 1,3 |
| **Week 11** | * Importance of renewable energy based power plant * Basic working principle of solar cell * PV module design * Grid-connected PV system design * Battery Sizing | 4 |
| **Week 12** | * Wind Power Plant * Biomass Power Plant * Review of lectures delivered so far and discussion with the students | 4 |

**IX. Evaluation Policy:**

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| --- | --- | --- | --- | --- | --- |
| **Marks Distribution:** | |  |  | | --- | --- | | Attendance  Quiz  Assignment  Presentation  Final Exam | 10%  20%  10%  10%  50% | | **Total** | **100%** | |
| **Grading System:** | As per DIU rule |

**X. Resources:**

Textbook(s):

[1] Principles of Power System, V.K .Mehta

[2] Power Plant Engineering, G. R. Nagpal

Reference(s):

[1] Power Station Engineering and Economy, B.G.A. Skrotzki, W.A. Vopat

[2] Electrical Power Station Design, Deshpande

**XI. Course Link in Moodle/Google Class Room:**

https://elearn.daffodil.university/course/view.php?id=2017

**XII. Course Instructor(s):**

* Name: Nusrat Chowdhury

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* Name: Kanij Ahmad

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Dr. Alam Mondal (DAM)

AND

MMB

**XIII. Approval of the teacher along with sign:**

I/We agree that you may excerpt some of my work to share with other teaching assistants and faculty. The purpose is to assess student learning and to improve teaching. I recognize that every effort will be made to keep this information confidential and that my name will not be associated with my comments.

Signature of the Instructors