

**King Fahd University Petroleum & Minerals**  
**Electrical Engineering Department**

Tentative Course Handout for FE 465 Power Transmission Term 052

**Instructor:** M. H. Shwehdi, Ph.D., Office: Bldg. 14 Room 261, Phone: 2712 (Coordinator)

**Textbook:**

Electric Power Transmission System Engineering Analysis and Design, By Turan Gonen, 1999 McGraw Hill

**Reference Book:**

Power System Analysis and Design by Glover & Sarma

**Notes and Handouts by instructor**

**Tentative Materials to Be Covered:**

Fundamental Concepts of Transmission Line Parameters, constants, steady state operation and models

Practical Limits of Line Voltages, Regulation

Dependence of conductor cost and type of transmission line

Economical Size of Line Conductor (Kelvin's Law)

Electrical Design of 0. H. T. L

Performance of 0. H. T. L

Ferranti Effect

Mechanical design of 0. H. T. L

The Stringing Chart

Poles and Towers, Insulators for 0. H. T. L

Voltage Distribution over A String Of Suspension Type Insulators

Method of Equalizing the potential across the insulator units

Corona

Protection of 0. H. T. L

Under ground Cables, Low, High voltage, Grading of a Cable

Distribution in Power Systems

Reactive Compensation in Power Systems

**Grading:** Homework class performance, course folder, and attendance: 15%

Exam: 20 %

Term Project: 35%

Final Exam: 30%

**Tentative Exam Dates:**

Exam # March 28, 2006, Or as will be Announce by Instructor

**The instructor will not tighten these requirements; however, he reserves the right to relax them.**

**Personal Information: Given Verbally, Guidelines:**

Makeup exams and late homework will only be permitted for officially excused absence

- Students are expected to attend, participate in all course activities, and to give oral presentation of their project and submit a full project term paper on due date.
- Students are required to attend all BI-weekly briefing meetings for term project progress -It is expected from each student to be able to learn independent studying habits, self reliance, and to be creative, analytical, able to develop and comprehends course materials with little help and assistant.

**Term Projects:**

Each student may work in each of the attached subjects list, each student should have a brief proposal within 2-weeks and must be approved by instructor, final project report, and each student should be able to present his work at the final presentation. Details of the project will be submitted in the first BI-Weekly meeting with course instructor, meetings should be arranged with instructor by the student.

Another alternative of Term project: any student have his own idea on a related topic can submit a term project preliminary proposal in the Third week, proposals should give a brief description of the project. Instructor will give suggestion, changing, refusals, of the topic, or go ahead within fourth week, proposals should contain statement of objectives, and methodology, and references, etc ... Should be briefly mentioned NOT MORE THAN (5) five PAGES (typed) PLEASE.

**Each term project report consist of**

- Abstract
- Introduction
- Literature review or theory
- Statement of the problem or objectives
- Data Schematics, and diagrams
- Program, method of analysis
- Calculations and results
- Conclusions
- References used

**Tentative Exam Dates:**

Exam March 28, 2006, Or as will be Announce by Instructoers

**Term project typed report will be due in: May 28, 2006**

NOTE: Syllabus material may also be presented out of the text. The instructor reserves the right to relax or cut some of the topics.

**A folder with notes, ungraded homework, exams, lab reports and extra work, neatly organized must be submitted to the instructor on due date of the term Project Suggested term paper projects list**

### **Topics for EE 465 Term Projects, Term 052**

**By: Dr. M- H. Shwehdi,**

- 1- USE of EDSA in calculation of Line Constant of Transmission and Under Ground Cables of some Transmission or distribution system.
- 2- Optimizing the design and selection of 0. H. T L Towers and Poles using CAD and/or software package
- 3- Modern Aspects of Power Transmission and its Technology
- 4- Development of Programs for Electrical and Mechanical Design of a 380KV T. L of 350 Km Length
- 5- Development of Program on How to calculate Transient over voltages on T. L
- 6- Development of programs on how to calculate Underground cables Ampacity, and temperature at each cablew insulation layer of Medium and Low voltage underground cables.
- 7- Development of program on how to predict and calculate thermal stress of cables and joints of industrial plants due to continuous variations of load.
- 8- Mat-lab Programs for Calculation and Analysis of Voltage Drop and losses in Distribution Systems
- 9- Environmental Effects on T. L. and underground cables (temp., Humidity, interference, soil resistivities, etc..)
- 10- Development of Matlab program to calculate thermal capabilities of underground cables for High Voltage system.
- 11- Mat-Lab program to calculate Electromagnetic Fields effects and Measurements around transmission and distribution Lines.
- 14- Development of program to conduct Insulation Coordination in Power Systems using calculation and charts.
- 15- Partial Discharges monitoring devices, and applications in the H. V. Underground Cables.
- 16- Latest Advances Associated With the checking and inspecting insulation Systems of High Voltage T. L and underground cables.