



A. Basic Information

Course Title: High Voltage Engineering

Code: EP415

Lecture: 3

Tutorial: 2

Practical: -

Total: 5

Program on which the course is given: B.Sc. Electrical Engineering (Electrical Power and machines)

Major or minor element of program: N.A.

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level: Fourth Year / First Semester

Date of specifications approval: 10/5/2006

B. Professional Information

1. Overall aims of course

By the end of the course the students will be able to gain the following issues:

- Safety and hazard issues in HV installation and systems.
- Non destructive testing of insulating materials. Biological effects of electromagnetic fields.
- Study of topics of breakdown and withstand in gases, liquids and solids.
- Practical related topics of insulation coordination, earthing and overvoltages are given.

2. Intended Learning outcomes of Course (ILOs)

a- Knowledge and understanding

- a.6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
- a.21) Basic power system design concepts for underground, cable tray, grounding and lighting systems.
- a.23) Principles of performing electrical systems calculations, including load flow, earthing and equipment sizing.

b- Intellectual Skills



- b.5) Assess and evaluate the characteristics and performance of components, systems and processes.
- b.6) Investigate the failure of components, system, and processes.
- b.10) Incorporate economic, social, environmental dimensions and risk management in design.
- b.11) Analyze results of numerical models and assess their limitations.
- b.12) Create systematic and methodic approaches in dealing with new and advancing technology
- b.14) Analyze design problems and interpret numerical data and test and examine components, equipment and systems of electrical power and high voltage engineering.

c- Professional and practical skills

- c.6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.
- c.7) Apply numerical modeling methods to engineering problems.
- c.8) Apply safe systems at work and observe the appropriate steps to manage risks.
- c.17) Apply modern techniques, skills and engineering tools to electrical power and high voltage engineering systems.

d- General and transferable Skills

- d.1) Collaborate effectively within multidisciplinary team.
- d.2) Work in stressful environment and within constraints.
- d.7) Search for information and engage in life-long self learning discipline.

3. Contents

No	Topic	No. of hours	ILOs	Teaching / learning methods and strategies	Assessment method
1	Electrical Safety and Electrical Hazards	4	a6, b6, c8, d2	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam



2	Grounding Principles and Practices	4	a21, a23, b5, c6, c17, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
3	Grounding Principles and Practices	4	a21, a23, b5, c6, c17, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
4	Non Destructive Testing Techniques	4	a6, b6, b14, c8, d7	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
5	Non Destructive Testing Techniques	4	a6, b6, b14, c8, d7	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
6	Biological Effects of Power Frequency Electromagnetic Fields Emanating from Power Lines	4	A6, b10, b11, c6, c7, c8, d2	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
7	Biological Effects of Power Frequency Electromagnetic Fields Emanating from Power Lines	4	A6, b10, b11, c6, c7, c8, d2	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
8	Overvoltages in Electrical Power Systems	4	a21, b5, b12, c7, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
9	Overvoltages in Electrical Power Systems	4	a21, b5, b12, c7, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam



10	Overvoltages in Electrical Power Systems	4	a21, b5, b12, c7, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
11	Overvoltages in Electrical Power Systems	4	a21, b5, b12, c7, d1	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
12	Insulation Co-ordination	4	a21, b6, b12, c7, d7	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
13	Insulation Co-ordination	4	a21, b6, b12, c7, d7	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
14	Insulation Co-ordination	4	a21, b6, b12, c7, d7	Lectures, Seminar / workshop, Class activity, Case study, Assignments / homework	Home Assignments, Quizzes, Oral Exam
Final exam					

4. Teaching and Learning Methods

Lectures
Seminar / workshop
Class activity
Case study
Assignments / homework

5. Student Assessment Methods

Assignments to assess knowledge and intellectual skills.
Quiz to assess knowledge, intellectual and professional skills.



Mid-term exam to assess knowledge, intellectual, professional and general skills.

Oral exam to assess knowledge and intellectual skills.

Final exam to assess knowledge, intellectual, professional and general skills.

6. Assessment schedule

Assessment 1 on weeks 2, 5, 9, 11

Assessment 2 Quizzes on weeks 4, 6, 10, 12

Assessment 3 Mid-term exam on week 8

Assessment 4 Oral Exam on week 14

Assessment 5 Final exam on week 15

7. Weighting of Assessments

4%	Home assignments
4%	Quizzes
20%	Mid-term examination
8%	Oral examination
64%	Final-term examination
100%	Total

8. List of References

8.1 Course Notes

- High Voltage Engineering by Prof. Dr. M. Abouelsaad, Dr. M.Anwar.

8.2 Essential Books (Text Books)

D E.kuffel, W.S. Zaengle and J. Kuffel, "High voltage engineering, Fundamentals", Newnes, Second edition reprint, 2001.

8.3 Recommended Books



- M. Khalifa, “ High voltage Engineering”, Marcel Dekker, Inc., first Edition, 1990.

9. Facilities Required for Teaching and learning

Lecture room equipped with overhead projector

Presentation board, computer and data show

Laboratory

Course coordinator: Prof. Dr. M.Abouelsad
Course instructor: Prof. Dr. M.Abouelsad, Dr. Mohamed Anwar
Head of department: Prof. Dr. Mousa Abd-Allah

Date: 1/ 12 / 2011