Title:	NON–DETERMINISTIC MODELLING

Module Code:

Core/Elective:

Aims & Objectives:

Introduce the basic criteria and techniques that are deterministically based and are u

Brief description of the module:

Introduction to deterministic criteria for power system applications, Basic concepts

Lecture hours: 15 **Tutorial hours:** 6

LEARNING OUTCOMES:

Knowledge and understanding

1. Identify the hierarchical levels of reliability assessment studies in power systems;
2. Understand the needs for power system supply under the competitive electric energy
3. Discuss the reasons for applying a non - deterministic (probabilistic) modelling for pow
4. Understand the increased modelling characteristics of power systems that are taken in
5. Appreciate the entire set of performance indices that more truly represent the power s

Intellectual skills

1. Design power generation and transmission systems in order to improve its reliability p
2. Justify the differences between the analytical and simulation modelling methods;

3.

Develop simple power system models for reliability studies;

4.

Evaluate the appropriate power system reliability indices;

5.

Make improvements of power system topology and operational practices with respect

 Practical skills

1.

Select a suitable configuration and topology of a power system and determine the min

2.

U se specialised software for power system reliability studies, write

3.

Use software to analyse alternative power system schemes and obtain the optimal on

Transferable skills and personal qualities

1.

Understand differences between theoretical and actual behaviour of power system op

2.

Ability to successfully use various simulation packages in order to perform required an

3.

Multidisciplinary approach to solving complex practical power system problems.

OUTLINE SYLLABUS:

Introduction to deterministic criteria for power system applications (1);
Basic concepts of power system reliability evaluation (1);
Main adequacy indices for power system reliability performance (1);
Markov modelling techniques (1);
Analytical techniques for reliability assessment of generation and transmission syste
Monte-Carlo methods (1);
Simulation methods for reliability assessment of generation and transmission system
Modelling of the stochastic nature for hydroelectric power plants and wind parks (2);
Reliability worth (2);
Reliability parameters of power system equipment (1);
Customer oriented performance indices of transmission and distribution systems ope

Coursework (including word length and relative weighting):

Nine hours of computer based laboratory work. A formal report is pre-requisite for th
The course work contributes 30% to the final module mark.

Examinations (including examination length, number of questions and relative w

There is a 2 (3) hour written examination with 4 (5) questions out of which students

Directed reading (state if material provided):

Staff involved: Prof. E. N. Dialynas

Other staff: Prof. M. Barboša

Date of last revision:

5 May 2008